



WEB GUIDE CONTROL SYSTEMS

Nireco Corporation —
researching and developing all areas of web control



Contents

● Liteguide 1

Electric EPC system 1

Features	2
Three basic EPC systems	2
Sample applications	3

Basic structure 4

Example of Liteguide system configurations	4
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System components 5

Liteguide Controller	
Liteguide Controller AE1000	5
Liteguide Controller AE500	6
Liteguide Controller AE120 Series	6
Motor-driven actuator	
Table of actuators	7
Motor-driven actuator K12	7
Motor-driven actuator K50	8
Motor-driven actuator K62.K62/A	8
Motor-driven actuator K80	8
AC servo actuator A031.....	9
AC servo actuator A151.....	9
AC servo actuator A352.....	9
AC servo driver unit model SP-***	9

Related devices 10

Centering sensor SI12-NE4	10
Fine adjuster MW3133	10
Remote control unit RP100	10
Local switch LA100	10
Guide roller mechanism (electric)	11
Compact guide roller mechanism (LCD series)	12

● Servoguide 13

Servoguide MK-IV 13

Overview	14
Features	14
Three basic EPC systems (hydraulic)	14
Typical Servoguide applications	15
Principle of EPC with the Servoguide MK-IV	16

Basic structure Servoguide MK-IV.D (Pneumatic-hydraulic model) 17

Examples of system configurations	17
Table of controllers	18
Model codes	18

System components Servoguide MK-IV.D (Pneumatic-hydraulic model) 19

D053: Low-load type	19
D121: Single type	19
D226: Twin type	20
D721: High-load type	20
2 (3): Pressure-resistant explosion-proof type	21

Basic structure Servoguide MK-IV.M (Electric-hydraulic model) 22

Example of system configurations	22
Table of controllers	23
Model codes	23

System components Servoguide MK-IV.M (Electric-hydraulic model) 24

M121-AM: Single type	24
M220-AM: Twin type	24
M721-AM: High-load type	25
M510-AM: Controller element	25
Power Guide Unit	
M820-AM: High-output/High-response type	25

Related devices 26

Webguide Amplifiers EH321B / EH322B / EH322B/AWL ..	26
Local switch LA100	26
Remote control unit RP100	26
Guide roller mechanisms (hydraulic)	27
Work cylinder	28
Selector switches: Standard specification/	
Pressure-resistant explosion-proof specification	28
Pressure gauges	28
Cap-type oil gauge	28
Oil pan	28
Centering sensor SI12-NE4	29
CN12(For Oil Pressure) Centering Nozzle	29
Decompression device RD-G	29

Servoguide MK-IV model selection table 30

● Sensors 31

Sensors 31

Table of sensors	32
Photohead PH16B	32
Photohead PH21	33
Photohead PH22	33
Photohead PH22VAS for vacuum environments	33
Line Follower Head LH19	34
Line Follower Head LH110	34
Line Follower Head LH500	35
DPC Design Position Control system	36
Photohead PH30/PH31	37
Ultrasonic Sensor UH01	38
Intrinsically safe anti-explosion systems	39
Autowide Sensor AWE280A	40
Linear Sensor LSE4096	40
CMOS Linear Sensor SLH30	41
Ultrasonic Autowide Sensor UHW series	41
High-temperature EPC sensor HE120A (for transparent webs) ..	42
Wire position sensors (analog position transmitters) ...	43
Sensing nozzle SN12G/SN15	44
Screw guider	44

Contents

● Wiring diagrams & dimensions 45

Wiring diagrams

46

Liteguide Controller AE1000 (for EPC)	46
Liteguide Controller AE1000 (for LFC)	46
Liteguide Controller AE1000 (for CPC•DPC)	47~48
Liteguide Controller AE500	48~49
Liteguide Controller AE120	49
Liteguide Controller AE122	49
Webguide Amplifier EH321B	50
Webguide Amplifier EH322B	50~51
AC servo driver unit SP	51
Intrinsically safe anti-explosion systems Ultrasonic Sensor UH01S/SA ..	52
Servoguide D models (standard)	53
Servoguide D models (explosion proof)	53
Servoguide M models (standard)	54
Servoguide M models (explosion-proof motor / pressure-resistant explosion-proof solenoid valve / control element air purge design) ..	54
Power Guide Unit (High-output/High-response controller) M820-AM ...	54

Dimensions

55

Liteguide Controller AE1000 (panel-mounted type)	55
Liteguide Controller AE1000 (shelf-mounted type)	55
Liteguide Controller AE500	56
Liteguide Controller AE120	56
Liteguide Controller AE122	56
Motor-driven actuator K12	57
Motor-driven actuator K62•K62/A	57~58
Motor-driven actuator K50	58
Motor-driven actuator K80	59
AC Servo Driver Unit SP	59
AC servo actuator A031	59~60
AC servo actuator A151	60
AC servo actuator A352	61
Centering sensor SI12-NE4	61
Remote control unit RP100	61
Fine adjuster MW3133	61
Local switch LA100	61

Servoguide MK-IV.D (pneumatic-hydraulic model)

D053: Low-load type	62
D053: Low-load type (2: pressure-resistant explosion-proof) ...	63
D121: Single type	64
D121: Single type (2: pressure-resistant explosion-proof)	65
D226: Twin type	66
D226: Twin type (2: pressure-resistant explosion-proof)	67
D721: High-load type	68
D721: High-load type (2: pressure-resistant explosion-proof) ..	69

Servoguide MK-IV.M (electric-hydraulic model)

M121-AM: Single type	70
M121-AM: Single type (explosion-proof type solenoid valve and motor) ..	70
M220-AM: Twin type	71
M220-AM: Twin type (explosion-proof type solenoid valve and motor)	71
M721-AM: High-load type	72
M721-AM: High-load type (explosion-proof type solenoid valve and motor) ..	72
M510-AM: Controller element	73
M820-AM: Power Guide Unit (High output/High response controller) ..	73

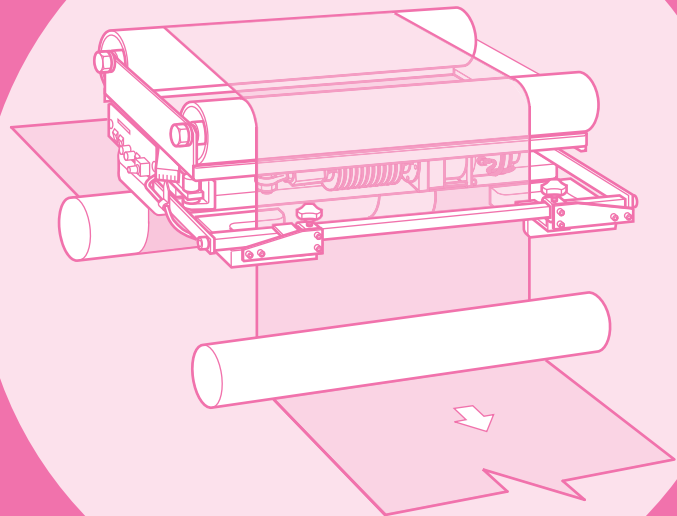
Related devices

Webguide Amplifier EH321B	74
Webguide Amplifier EH322B	74
Centering nozzle CN12	75
Switch box (for AC)	75
Switch box (for AC)	75
Pressure-resistant explosion-proof model switch box (for AC) ..	76
Pressure-resistant explosion-proof model switch box (for AM) ..	76
Decompression device RD-G	76
Oil pressure gauge	76
Cap-type oil gauge	77
Air pressure gauge (for checks)	77
Oil pan	77

Sensors

Photohead PH16B	78
Photohead PH21	78
Photohead PH22	78
Photohead PH22VAS-T	79
Photohead PH22VAS-R	79
Line Follower Head LH110	80
Line Follower Head LH500	80
Line Follower Head LH19	80
Linear Sensor LSE4096	81
Ultrasonic Sensor UH01 series	82
Zener barrier	83
CMOS Linear Sensor SLH30	83
Autowide Sensor AWE280A	84
Ultrasonic Autowide Sensor UHW051	84
Ultrasonic Autowide Sensor UHW280	85
Ultrasonic Autowide Sensor UHW500	85
Ultrasonic Autowide Sensor UHW700	85
High-temperature EPC sensor HE120A	86
Fiber cable	86
Sensing Nozzle SN12G/SN15	87
Photohead PH30N/PH30P	88
Position transmitter wire position sensor FW22	88
Position transmitter wire position sensor FW31	89
Screw guider	89

Liteguide electric EPC system



Electric EPC system

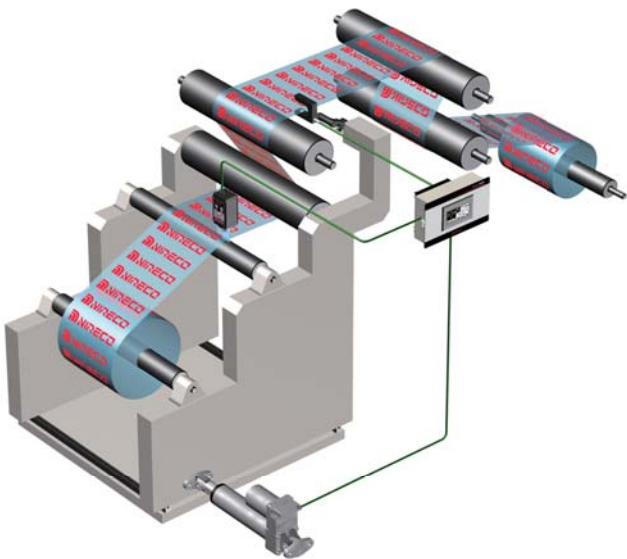
The Liteguide electric EPC system is a fully electric EPC system designed for small machines. This system is composed of a Photohead (edge sensor), Liteguide Amplifier, motor-driven actuator, and centering sensor. It is recommended as an EPC especially for light loads.

Electric EPC system

Features

- Compact, self-contained design requires minimum space for installation.
- Various sensors are provided for application requirements.
- Alarm indication for malfunctions.
- Center Position Control (CPC) is available.
- Web position can be finely adjusted with the remote control unit.

Example of use with a rewinding machine



What is EPC®?

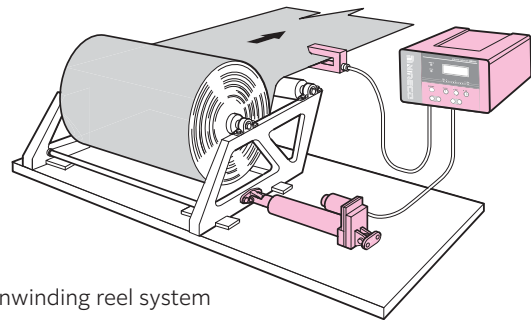
EPC is the acronym for Edge Position Control, and is a registered trademark of NIRECO. It is a system that automatically controls the edge of a web of sheets such as paper, plastic film, foil, rubber or textiles.

EPC can uniformly align unevenly rolled-up web edges. If connected to a printed material inspection machine or other similar device, more precise inspection results can be obtained.

Three basic EPC systems

Unwinding reel system

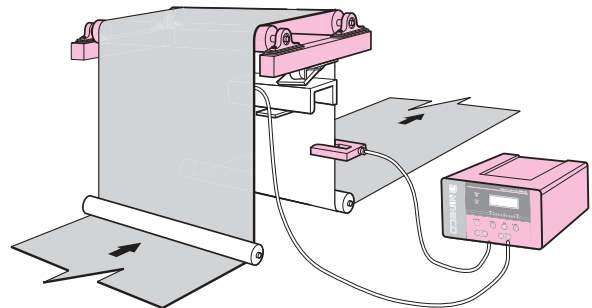
This system controls the feeding of an irregularly wound roll into a process, such as slitting, printing or laminating, where uniform edge control is required. When the Photohead is mounted at the desired web edge position, this system controls the actuator to move the unwinding reel in the direction necessary to restore the edge to the correct position.



Unwinding reel system

Intermediate guide roller system

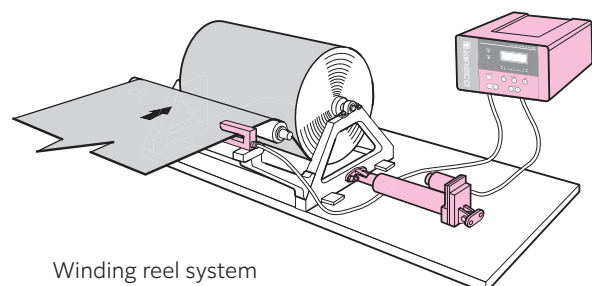
This system is used where meandering of the web occurs in the middle of a process or where problems will occur in the next continuous process unless the web edge is controlled. The Photohead is also mounted at the desired web edge position, and control is performed by moving the guide rollers about a pivot so that the web edge is always located at the sensor position. Guide rollers are available in two types: an end-pivot type and a center-pivot type.



Intermediate guide roller system

Winding reel system

This system is used to control the web edge and to wind the web. While the Photohead interlocks with the winding reel, one fixed roller is provided between them. The web is left to meander. The Photohead follows the edge (via a servomechanism) at all times to control the web edge and wind the web.

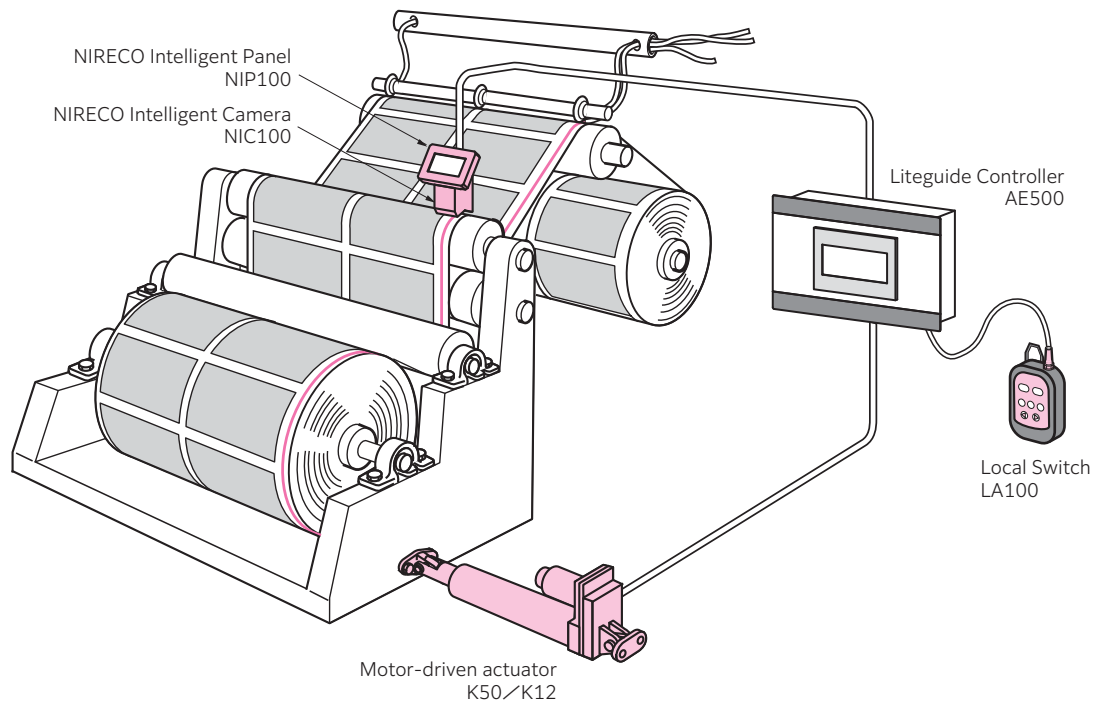


Winding reel system

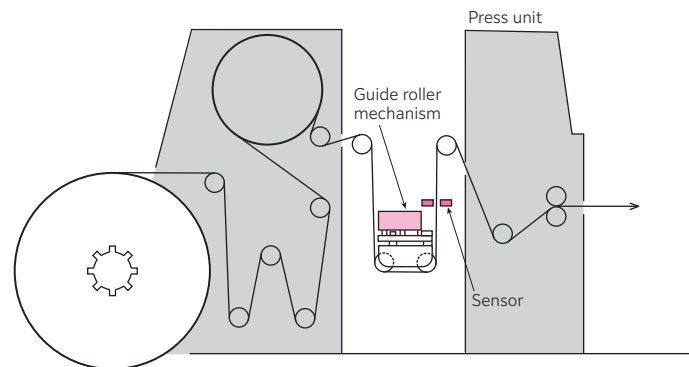
Sample applications

Slitter machines

The Liteguide for slitter machines detects the slitter line or pattern printed on the web, using a Line Follower Head while moving the unwinding reel in the opposite direction to displacement, to maintain the correct position of the passing web at all times. Thus, the meandering of the web, due to irregularities, elongation, shrinkage, uneven thickness, etc., is completely compensated for, to enable high-precision slitting.



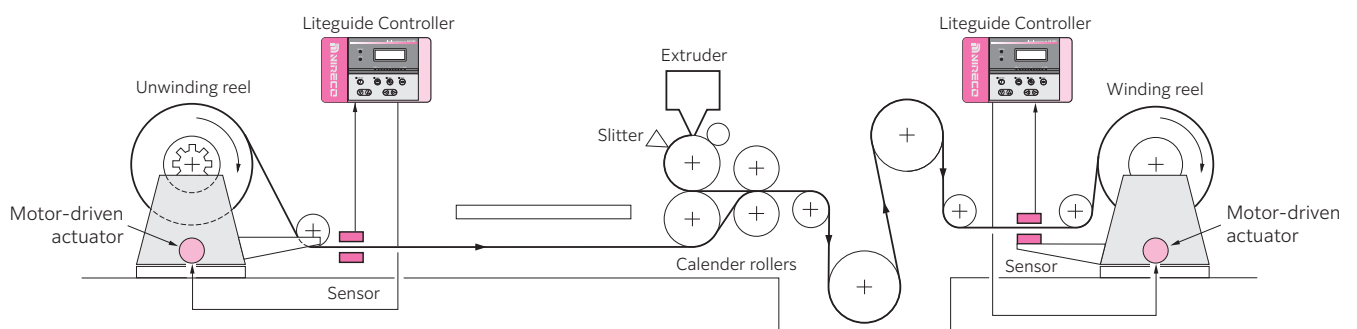
Business-form rotary presses



Example of application of Liteguide for a business-form press

General purposes

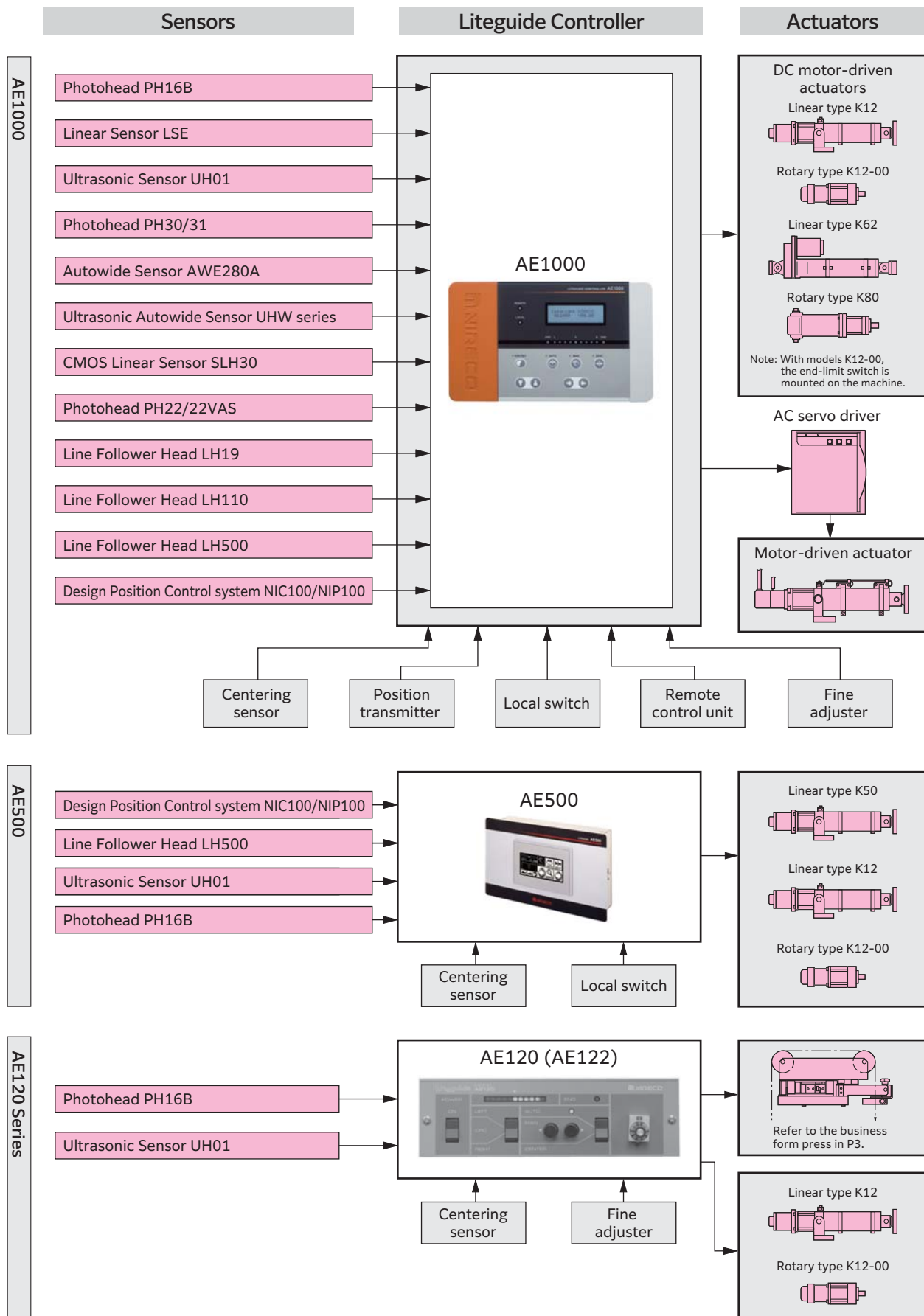
Liteguides can be used in a wide range of applications: general unwinding, winding and the control of intermediate guide rollers.



Example of application of Liteguides for a coating line

Basic structure

Example of Liteguide system configurations



System components

Liteguide Controller AE1000

The Liteguide Controller AE1000 carries out EPC (Edge Position Control) through a combination of Photoheads (PH16B) and Ultrasonic Sensor (UH01). It carries out CPC (Center Position Control) through a combination of Photoheads and Autowide Sensor (AWE280, etc.). It carries out LFC (Line Follower Control) through a combination of the LH19 and LH110.

- This model can be connected to the standard Nireco sensors used by the previous AE900E and AE900L models. (Some sensors will need to be used together with a preamplifier.)
- The AE1000 can be connected directly to the K12 and K62 motor-driven actuators. In addition, it can be connected to an AC servo actuator via a driver.
- Has 2 systems, a sensor input stage and a shift input stage, which can be switched for use.
- The AE1000 has a large, white-backlit LCD display that is easier to read and can allow the operator to check more information than before.



Power supply voltage	100 to 240 V AC, 50/60 Hz $\pm 10\%$	
Power consumption	300 VA (Incoming current 50 A, 5 ms type (200 V))	
Power source fuse	250 V AC, 3.15 A (Time-lag type)	
Ambient temperature	0 to +50°C	
Ambient humidity	35-85% RH or below (no condensation)	
Vibration resistance	3.5 mm, 1 G, 3 to 150 Hz, 3 directions (1 hour)	
Power supply noise	2.5 kVp-p, Normal mode, Common mode 50 nS, 1 μ S width	
Usage atmosphere	Area with no water, flammable or corrosive gases, and little dust.	
Mass	Approx. 5 kg	
Input	2 sensor systems: 2 analog shift systems: Centering: Position transmitter: Photo coupler input (12 V DC, 15 mA):	Voltage input maximum ± 5 V (No input resistance/2 k Ω) Current input 0-20 mA (input resistance converted to 240 Ω) Voltage input maximum ± 10 V Proximity sensor input (0-8 V, 1.2 k Ω input resistance) (Applies to: MD0004270-JA) Voltage input maximum ± 10 V Remote controller: Operation mode switching(auto/manual/centering) Operation keys (left/right/auto balance/reverse) System selection (EPC1/EPC2) Locks: 3 points Actuator end limit: 2 points
Output	Electrical actuator: Lamp power source: Fine tuner, Position transmitter: Sensors: Centering proximity switch power source: 2 indicator systems: Photo coupler output (24 V DC, 40 mA):	K12 ± 24 V DC, 1 A (maximum) K62 ± 36 V DC, 2 A (maximum) K80 ± 48 V DC, 2 A (maximum) 4 to 12 V DC, variable (maximum 1 A) ± 5 V power source (maximum 0.1 A) ± 15 V power source (+15 V, 1 A; -15 V, 0.2 A) (Note: The current capacity on the + side combined with the lamp power source is less than 1 A.) 8 V DC (maximum 30 mA) Voltage output Maximum ± 10 V (load resistance 2 k Ω or greater) Deviation output Position transmitter output Remote controller: Operation mode state (auto/manual/centering) System state (EPC1/EPC2) NOR/REV Alarms Excessive deviation End limit Actuator lock Actuator excessive load * Amplifier fault * "Amplifier fault" shares the same terminal as "NOR/REV output." You can switch from one to the other.
IP grade	IP20 (IP grade for the front panel only: IP30)	

Liteguide Controller AE500

The AE500's best performance is achieved in combination with either the NIC100/NIP100 or the LH500. Operability has been enhanced by the use of touch type display and control panels and icons that can be operated intuitively.

- This controller has been made compact and lightweight by limiting its functions to those that are needed in the operation of slitters and inspection machines.
- The LCD touch-screen panel means that you can perform operations in a single action.
- When used with the LH500, the controller can display the signal waveform so that the operator can check the line and edge detection status.



Power supply voltage	DC +24 V, 4 A (peak correlation 6 A approx. 50 msec) · When the NIC100 + NIP100 are used, the power supply is DC +24 V, 6 A or greater. (when controller and motor are to be used with a shared power supply) * If power supplies are provided separately, the following capacities should be used. Controller power supply: DC +24 V, 1 A (When the NIC100 + NIP100 are used, the power supply is 3 A.) Motor power supply: DC +24 V, 3 A (peak correlation 6 A approx. 50 msec) Power supply fuse: 3.15 A, DC 24 V (time-lag type)
Mass	1.7 kg
Operating environment	Temperature range: 0 to +50°C Humidity range: 35 to max. 85% RH (no condensation) Vibration resistance: able to withstand a vibration amplitude of 3.5 mm, 1 G, 3 to 150 Hz, in 3 axes (for a duration of 1 hour) Power supply noise: 2.5 kVp-p, normal mode, common mode, 50 ns, 1 μs pulse width Atmosphere: Operate in an environment with no moisture droplets, flammable gas or dust.

Liteguide Amplifier AE120 Series

We offer two model types for the AE120 Liteguide Amplifier series, a panel attachment type and a wall attachment type.

Model	Description
AE120	Panel mounting type
AE122	Wall mounting type

Input	Sensor	PH16B, UH01
	Centering	SI12-NE4
	Fine adjuster	MW3133
	Remote control unit	RP100 Auto/Manual/Centering
	Lock function	Contact input 15 V DC, 1 mA
Output	Motor	DC±24 V 1 A
	Lamp power supply	DC12 V 1.8 W
	End alarm	Contact output: 1 A Contact capacity: 250 V AC, 0.1 A 24 V DC, 0.1 A
Power supply		100 to 240 V AC (automatic changeover) 50/60 Hz
Power consumption		100 VA (Note)
Ambient temperature		0 to +50°C
Ambient humidity		35-85% RH (no condensation)
Protective structure rating		IP30
Mass		AE120: 2.5 kg, AE122: 2.7 kg

Note: If a breaker or other device is installed externally, please set the breaker capacity to at least 4 A, taking into account the inrush current of the internal power supply.



Liteguide Amplifier AE120 (panel-mounted type)



Liteguide Amplifier AE122 (wall-mounted type)

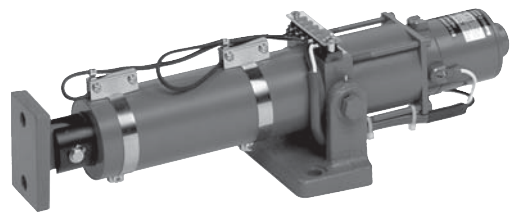
Table of actuators

Item	Model	Output	Torque N cm	Rated speed rpm	Thrust kN	Stroke mm	Rated speed mm/s (under no load)
1	K12-00-70	Rotary type	120	80	—	—	—
2	K12-00-450	Rotary type	30	450	—	—	—
3	K12-32-07	Linear type	—	—	0.3	32	8
4	K12-32-20	Linear type	—	—	0.15	32	40
5	K12-80-07	Linear type	—	—	0.3	80	8
6	K12-80-20	Linear type	—	—	0.15	80	40
7	K12-150-07	Linear type	—	—	0.3	150	8
8	K12-150-20	Linear type	—	—	0.15	150	40
9	K50-150-20	Linear type	—	—	1.5	135	20
10	K50-200-20	Linear type	—	—	1.5	185	20
11	K50-150-20/A	Linear type	—	—	1.5	135	20
12	K50-200-20/A	Linear type	—	—	1.5	185	20
13	K62-150-20	Linear type	—	—	1.5	135	20
14	K62-200-20	Linear type	—	—	1.5	185	20
15	K62-200-20/A	Linear type	—	—	1.5	135	20
16	K62-200-20/A	Linear type	—	—	1.5	185	20
17	K80-00	Rotary type	200	100	—	—	—
◇ 18	A031-80-20	Linear type	—	—	0.3	80	22.5
◇ 19	A031-150-20	Linear type	—	—	0.3	150	22.5
◇ 20	A151-150-20	Linear type	—	—	1.5	135	24
◇ 21	A151-200-20	Linear type	—	—	1.5	185	24
◇ 22	A352-150-20	Linear type	—	—	3.5	150	20

* Note: Items marked with ◇ are AC servo motor items.

Motor-driven actuator K12

We have translatory and rotary models in the K12 series. Both types are strengthened to withstand thrust loads. They are constructed to control thrust direction as much as possible. The translatory motor-driven actuators have a planetary gear and ball screw within a single structure, for strength and precision.



Motor-driven actuator K12-80-* *

Model	Output	Torque N·cm	Rated Speed rpm	Thrust kN	Stroke mm	Speed mm/s	Mass kg	Rated voltage DCV	Ambient temperature °C	Ambient humidity	Protective structure rating
K12-00-70	Rotary	120	80*	—	—	—	1.2	24 (1 A)	0 to +40°C	35-85% RH (no condensation)	IP40
K12-00-450	Rotary	30	450*	—	—	—	1.2				
K12-32-07	Linear	—	—	0.3	32	8*	2.9				
K12-32-20	Linear	—	—	0.15	32	40*	2.7				
K12-80-07	Linear	—	—	0.3	80	8*	3.1				
K12-80-20	Linear	—	—	0.15	80	40*	3.0				
K12-150-07	Linear	—	—	0.3	150	8*	3.7				
K12-150-20	Linear	—	—	0.15	150	40*	3.7				

* Note: Rated Speeds and speeds shown are when unloaded.

Motor-driven actuator K50

The K50 is connected to a controller (AE500) and is mainly used in EPC systems. This linear motion actuator has a robust construction that features a reduction mechanism (spur gear) and ball screw as a single piece.



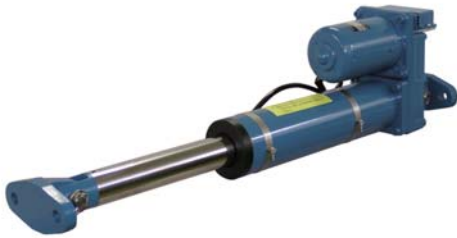
Actuator K50-200-20

Model	Thrust kN	Stroke mm	Speed mm/s	Mass kg	Rated voltage DCV	Ambient temperature	Ambient humidity
K50-150-20	1.5	135	20*	6	24 V (2.5 A)	0 to +40°C	35-85% RH (no condensation)
K50-200-20		185		6.5			
K50-150-20/A		135		6.5			
K50-200-20/A		185		7			

* Note: Speeds shown are when unloaded.
A: With an internal centering sensor

Motor-driven actuator K62.K62/A

The K62 series is a strong actuator combined into a single structure with a planetary gear and ball screw. In addition, the K62 actuator uses a high-output DC motor and has the highest thrust of the K series. Its sister-product, the K62/A actuator, is equipped with an internal centering-sensor.



Actuator K62-150-20



Actuator K62-200-20/A (with centering sensor)

Model	Thrust kN	Stroke mm	Speed mm/s	Mass kg	Rated voltage DCV	Ambient temperature	Ambient humidity
K62-150-20	1.5	135	20*	6	36 V (2 A)	0 to +40°C	35-85% RH (no condensation)
K62-200-20		185		6.5			
K62-150-20/A		135		7			
K62-200-20/A		185		8			

* Note: Speeds shown are when unloaded.
A: With an internal centering sensor

Motor-driven actuator K80

The K80 actuator is a high-precision rotary model in combination with a high-power DC motor and a planetary gear.

Torque	196 N·cm
Rated speed	100 rpm *
Mass	3 kg
Rated voltage	48 V DC (2 A)
Ambient temperature	0 to +40°C
Ambient humidity	40-90% RH (no condensation)
Protective structure rating	IP40 Indoor type

* Note: Rated Speed shown are when unloaded.



Actuator K80-00

AC servo actuator series

These actuators are connected to an AC servo driver unit, and are primarily used as drives for EPC systems.

AC servo actuator A031

This actuator has an integrated speed-reduction gear (planetary gear) and ball screw, which minimizes gear backlash.

- High-precision, high-speed control
- This actuator uses an AC servo motor (brushless) and is suitable for clean environments.



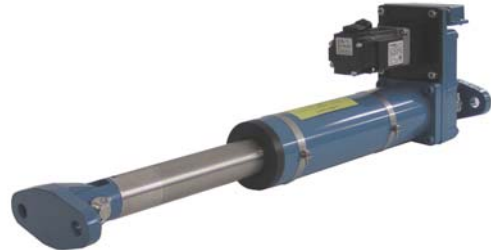
Model	Stroke mm	Speed mm/s	Thrust kN	Mass kg	Ambient temperature	Ambient humidity	Protective structure rating	Motor Output (W)
A031-80-20	80	22.5*	0.3	3.2	0 to +40°C	30-80%RH (no condensation)	Indoor type	50
A031-150-20	150			3.7				

* Speeds shown are when unloaded.

AC servo actuator A151

Solidly built, with an integrated speed-reduction and ball screw.

- High-precision, high-speed control
- This actuator uses an AC servo motor (brushless) and is suitable for clean environments.



Model	Stroke mm	Speed mm/s	Thrust kN	Mass kg	Ambient temperature	Ambient humidity	Protective structure rating	Motor Output (W)
A151-150-20	135	24*	1.5	6	0 to +40°C	30-80%RH (no condensation)	IP40 Indoor type	100
A151-200-20	185			7				

* Speeds shown are when unloaded.

AC servo actuator A352

A totally enclosed structure that combines a highly efficient ball screw and an AC servo motor.



Model	A352-150-20
Nominal speed	Approx. 20 mm/s (when motor speed is 2000 min ⁻¹)
Mechanical stroke	150 mm * stroke between the reed switches
Usable stroke	140 mm * stroke between the reed switches
Thrust	3.5 kN
Motor specifications	Output 0.2 kW Voltage 200 V AC
Lubrication	Grease applied
Piston rod rotational torque	Approx. 6 N·m
Ambient temperature	0 to +40°C
Ambient humidity	30-80% RH (no condensation)
Relative humidity	No more than 80%RH
Protective structure rating	IP40 Indoor type
Mass	23 kg
Paint color (standard color)	7.5BG 4/6 (RoHS)

AC servo driver unit model SP-***

This unit contains essential devices such as a servo driver, circuit protector, relay, and terminal block. It can be located between the Liteguide Controller and the AC servo actuator, to simplify the wiring between the components in the system.



Power source	ø1; 200V AC; 50/60 Hz; 1.0 kVA
Ambient temperature	0 to +50°C
Storage temperature	-20°C to +70°C (no condensation)
Ambient humidity	45-85% RH (no condensation)
Protective structure rating	IP20
Installation	Wall mounting, panel, or shelf
Mass	9.2 kg

Note: AC servo drivers are used in speed- or torque-control modes.

Controller	Thrust	Servo driver rating
SP-151	0.3 kN	50 W
	1.5 kN	100 W
SP-352	3.5 kN	200 W

Related devices

Centering sensor SI12-NE4

This sensor is set up with the winding/unwinding reel in its central position. It is a position sensor that is used to keep the guide roller in its center position.



Detecting length	Approx. 3 mm	
Standard object	Ferrous material 12×12×1t or more	
Applicable objects	Ferrous/non-ferrous material	
Rated operating	Rated voltage	8 V DC (R1 = 1 kΩ)
	Allowable ripple rate	Less than 10%
	Repetitive error	Less than 3%
	Temperature characteristics	±10% within
	Unevenness of the movement distance	±10% within
	Operating current	Non-detection: 3 mA or more Detection: Less than 1 mA
	Hysteresis	1~10%
Resistance to environment	IP67	
Allowable wiring resistance	Total resistance: 1000 Ω or less	
Ambient temperature	-25 to +60°C	
Ambient humidity	10-85% RH (no condensation)	
Protective structure rating	IP67	
Case material	Nickel brass	
Cable	PVC 2 m±10%	
	D (ø4.2), P (2), q (0.25 mm ²)	
Tightening torque	Less than 12 N·m	
Mass	140 g	

Fine adjuster MW3133

The fine adjuster for web position is mounted on the Liteguide Amplifier. Operation is much easier when the fine adjuster is installed near the operator.



Remote control unit RP100

The RP100 remote control head lets you operate the Liteguide Controller and the Web Guide Amplifiers remotely. You can use the RP100 to control each operation of the Liteguide controller (operations in the control mode and shifting the control position).



Power supply	Receives power from the AE1000, AE500 and EH322B
Ambient temperature	0 to +50°C
Ambient humidity	35-85% RH (no condensation)
Protective structure rating	IP50
Cable length	20 m
Mass	0.7 kg

Local switch LA100

The LA100 hand switch lets you operate the Liteguide Controller and the Web Guide Amplifier remotely. You can use the LA100 hand switch to control each operation (switching control mode, shifting control position, controlling the auto balance and switching between NOR and REV directions).



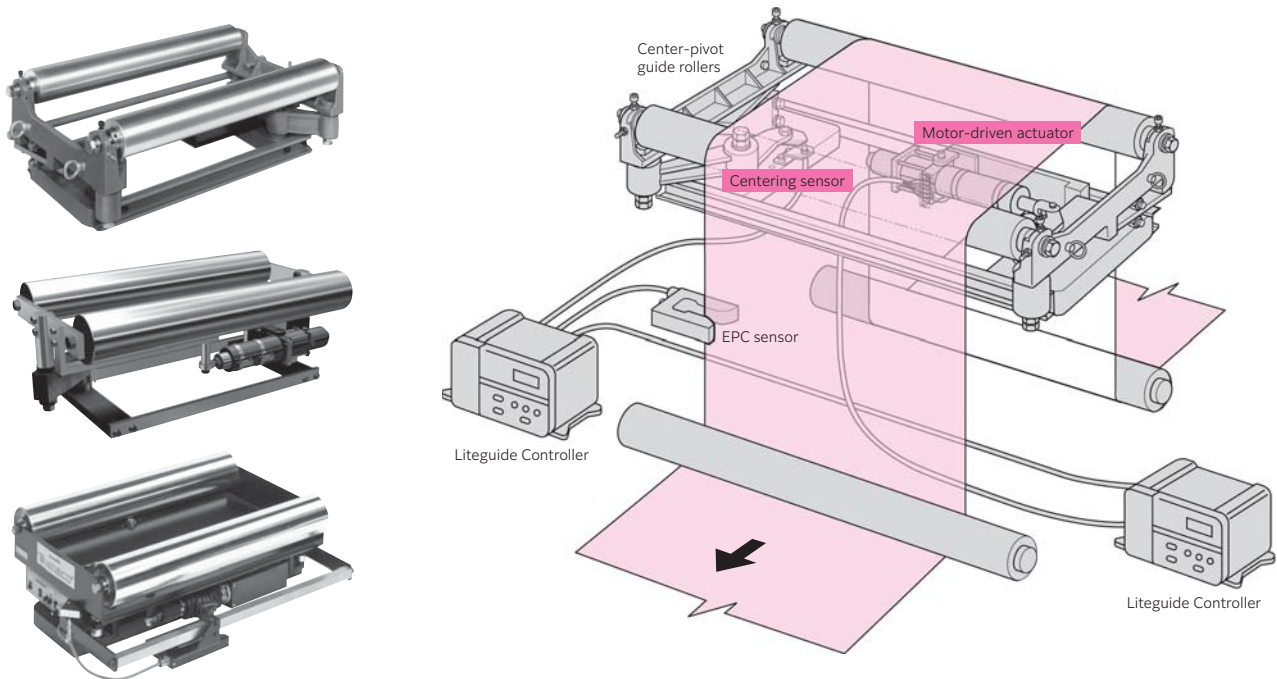
Power supply	Receives power from the AE1000, AE500 and EH321B
Ambient temperature	0 to +50°C
Ambient humidity	35-85% RH (no condensation)
Protective structure rating	IP50
Cable length	5 m
Mass	0.8 kg

Guide roller mechanism (electric)

The guide roller mechanism is used to correct the meandering of the traveling web. The guide roller mechanism is available as either a center-pivot system or an end-pivot system. NIRECO provides the guide roller mechanism suited to the requirements of the web quality, width, tension, correction quality and speed and installation conditions by applying its extensive experience with EPC technologies.

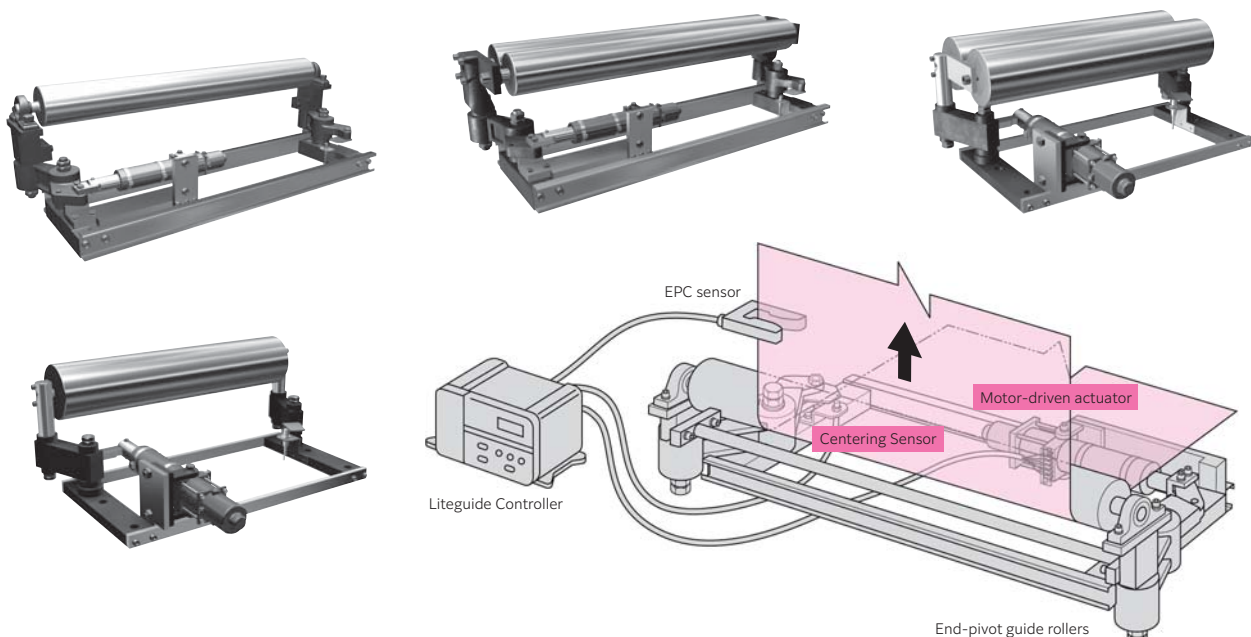
Center-pivot guide roller mechanism (LCD series)

The center of rotation is the center of the planar extending surface of the web on the side where it enters the guide roller. This method may be applied for webs which are likely to break or have a permanent distortion due to the tension difference between both edges of the web, i.e., non-elastic materials such as paper, newsprint paper, coating paper, metal, foil, cellulose, acetate, fragile plastics, etc.



End-pivot guide roller mechanism (LED series)

This method may use 1, 2, or 3 rollers, and will be selected depending on the location where it will be used. It is generally used under light loads, to control elastic webs such as cellophane, vinyl, or polyethylene, or when handling webs that will easily absorb changes in tension at either end of the web. In addition, the end-pivot method can easily be installed in the middle of the production line.



Compact guide roller mechanism (LCD series)

This compact guide roller mechanism is Nireco's EPC (Edge Position Control) system that seeks to achieve both ease of use and cost performance that are essential to web conveyors. Nireco sells integrated systems that use the center-pivot approach that puts very little load on the web and integrates the guides, controller and sensors. In response to strong market needs, Nireco will soon begin sales of a new guide roller system that saves time and labor, and is easy to use.



- Simply connect the primary power supply to the system – there's no need for initial adjustment.
- With only simple periodic checks, this system can steadily run for a long period (in an optimal working environment).
- Optimal for use with low-tension, flexible webs.
- The system can be operated via a remote control panel (optional) at a distance of up to 10 meters.
- Simple, solid construction at an economical price.

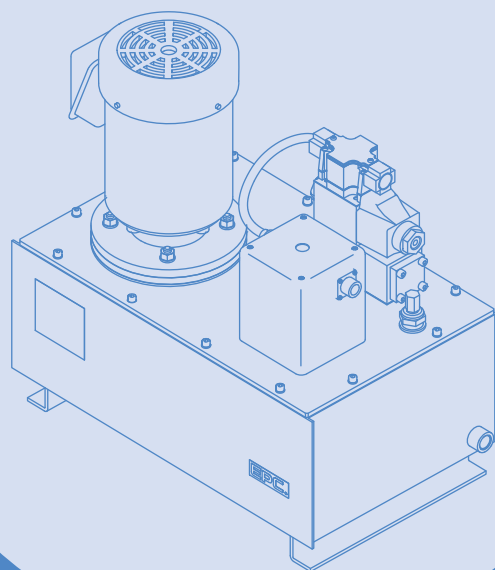
Power source voltage	24 V DC
Power consumption	100 W (24 DC, 4A max.)
Roller surface length	250 to 550 mm (50 mm increments), maximum length: 610 mm
Roller diameter	ø50 mm (standard)/ø80 mm
Tension	200 N
Line speed	max. 250 m/min.
Adjustment	±10 mm
Ambient temperature	0 to +50°C
Ambient humidity	35-85% RH (no condensation)
Mass	15 kg to 22 kg

Model list

MODEL.	
LCD□□□-□-□□□-□□-□-△	
Options	: Non-standard option details are described as Y.
Paper pass	: 1: Pressure 2: Tension 3: Z wrap (sensor below) 4: Z wrap (sensor above)
Amp attachment	: 1: Upward facing 2: Downward facing 3: Separate attachment (cable length 5 m)
Amp attachment direction	: L: Facing left, when viewed from fulcrum R: Facing right, when viewed from fulcrum
Sensor attachment	: 1: Standard (semi-permanent) 2: Manual operation 3: Motorized operation (OP)
Sensor position	: L: On the left, when viewed from fulcrum R: On the right, when viewed from fulcrum C: On both sides
Sensor select	: P: PH16L U: UH01L
Roller diameter	: 5: ø50 (standard) 8: ø80
Roller surface length	: 250: 300: 350: 400: 450: 500: 550: 610 Rollers are brushed aluminum

Servoguide MK-IV

**Servoguide
hydraulic EPC system**



Servoguide MK-IV

The Servoguide MK-IV is a new type of hydraulic controller which embodies our long experience and technology in the field of web control.

Servoguide MK-IV

Overview

Servoguide MK-IV.D Pneumatic-hydraulic EPC

This Servoguide uses an extremely simple pneumatic mechanism for edge detection. Its controller is also pneumatic, which means that an amplifier is not required.

Servoguide MK-IV.M Electro-hydraulic EPC

The Servoguide MK-IV.M is an electro-hydraulic EPC device. This is the most precise and responsive control method currently available. We also offer a full range of sensors for all applications and reliability needs, and hydraulic servo valves for all loads and operating speeds. Besides EPC, these components can be used in systems for LFC (Line Follow Control) and for CPC (Center Position Control).

Features

Servoguide MK-IV.D Pneumatic-hydraulic EPC

- High thrust at low cost can be obtained, compared with electric actuation.
- Has a special, noise-reducing design. (Operating noise level: below 65 dB(A)).
- The non-contact rotary blower provides filtered air, for long service life and easy maintenance, compared with the previous model.
- Pressure-resistant explosion-proof, and improved explosion-proof versions of all models are available.
- Inexpensive systems can be configured, since no controller is required.
- Since detection by air is used, these Servoguides can be used with webs of a wide range of materials.

Servoguide MK-IV.M Electro-hydraulic EPC

- You can select the electronic sensor to use, depending on the application.
- In addition to normal integral action, proportional action is achievable by installing a position transmitter on the cylinder.

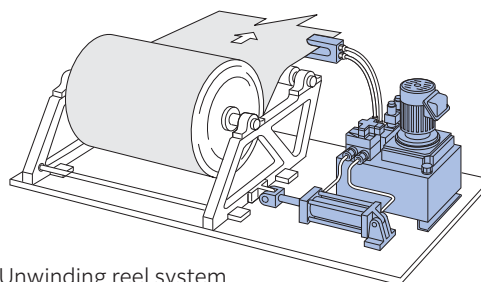
What is EPC®?

EPC is the acronym for Edge Position Control, and is a registered trademark of NIRECO. It is a system that automatically controls the edge of a web of sheets such as paper, plastic film, foil, rubber or textiles.

Three basic EPC systems (hydraulic)

Unwinding reel system

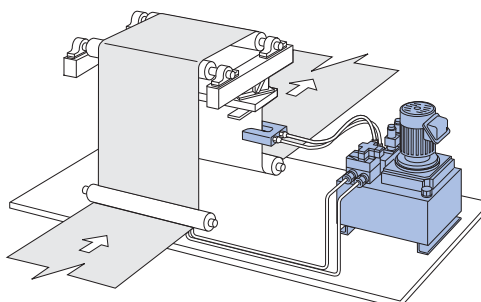
This method is used when an irregularly wound mill roll should be fed to the next process, such as a slitter, printing press or laminator, with an even edge position. The sensor is fixed in the desired position, as shown in figure one, and the work cylinder moves the reel so that the edge of the web is always at that position.



Unwinding reel system

Intermediate guide roller system

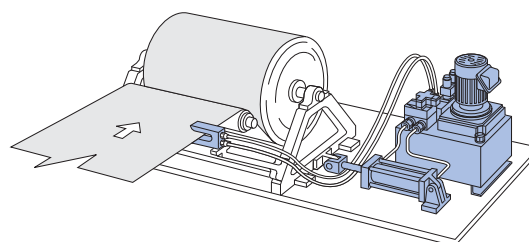
This system is adopted when the web meanders in the middle of a process or where problems will occur in the next continuous process unless the web edge is controlled. The sensor is fixed at the desired web edge position, and control is performed by guide rollers that turn on a pivot so that the web edge is always located at the sensor position. Guide rollers are available in two types: an end-pivot type and a center-pivot type.



Intermediate guide roller center-pivot system

Wind-up reel system

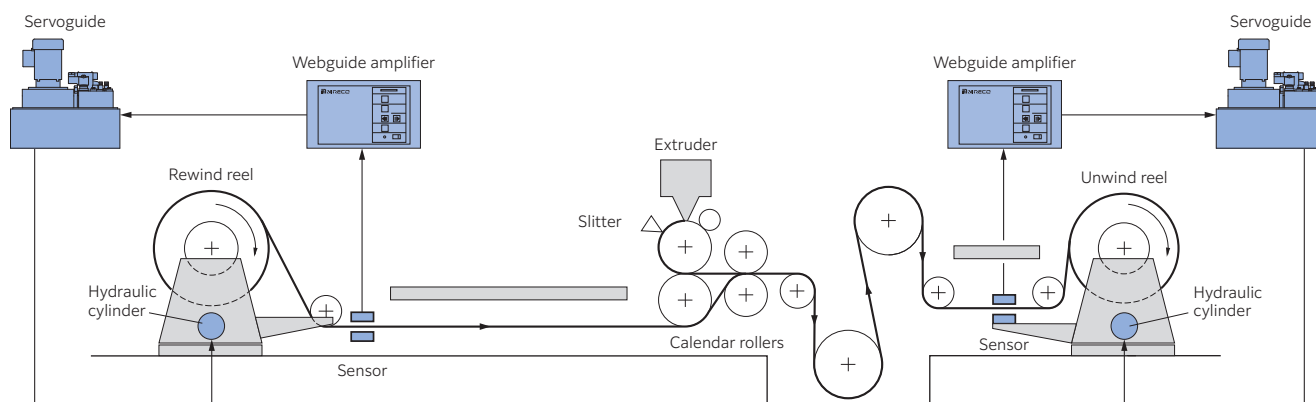
This method is used to wind the web onto a reel with the edge aligned smoothly. The sensor is joined together with the windup reel, and a single fixed roll is interposed between the sensor and the reel. The web continues to meander, but the sensor which is connected to the reel constantly follows the edge (moved by a servo), enabling the web to be wound onto the reel with its edge aligned smoothly.



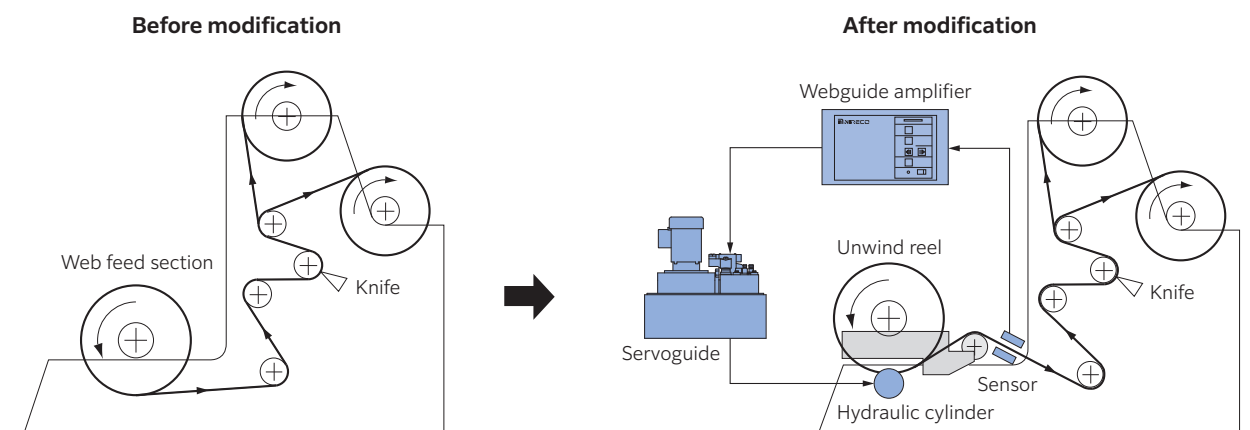
Wind-up reel system

Typical Servoguide applications

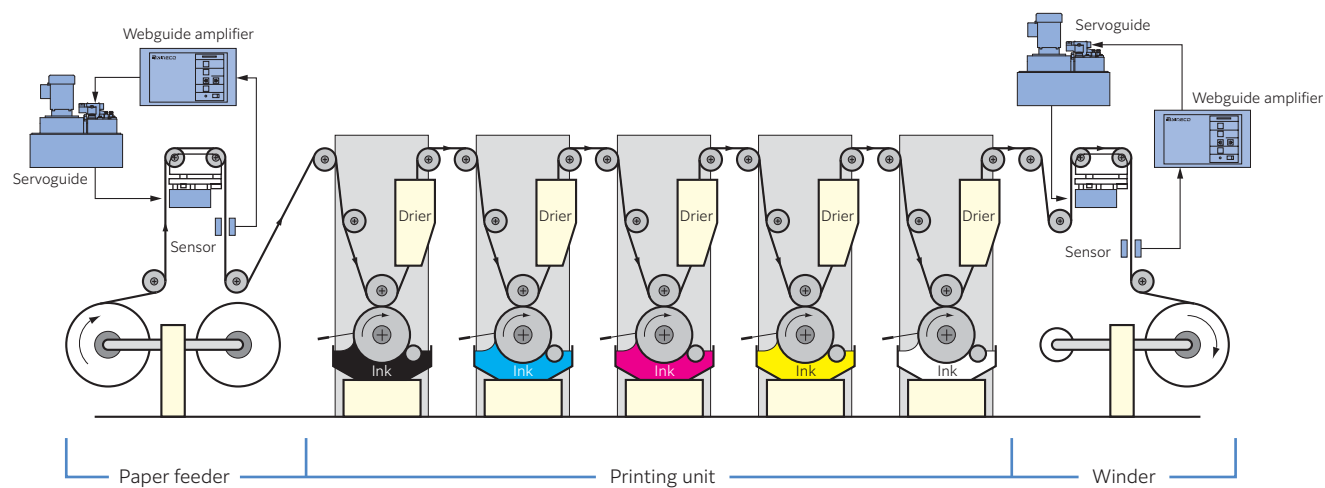
Laminator



Slitter



Gravure printing



Servoguide MK-IV.D

Pneumatic-hydraulic EPC

The EPC system arranges the edge of a web consistently. The sensing nozzle detects displacement of the web edge not contacting the web. The primary air pressure is supplied to the sensing nozzle from the blower in the Servoguide MK-IV.D controller. The air flux is interrupted by the web edge, and thus secondary air pressure is produced as a pneumatic output signal proportional to displacement of the web edge. This pneumatic output signal is transmitted to the diaphragm of the Servoguide. The signal is converted into force by the diaphragm to move the spool. The force generated by the diaphragm is balanced by the spring force when the web edge covers one half of the slit of the sensing nozzle, and the spool is located at the center.

When the edge of a web is displaced, the pneumatic output signal actuates the spool of the Servoguide, and the hydraulic oil from the hydraulic pump is transmitted to the work cylinder. The work cylinder is activated to move the web in the reverse direction to the meander to perform EPC and achieve a consistent web edge position.

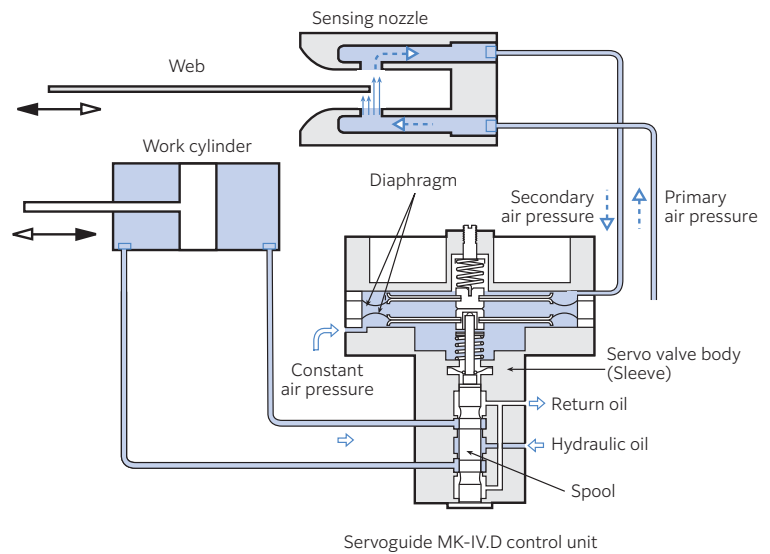


Diagram of working principle

Servoguide MK-IV.M

Electro-hydraulic EPC

The displacement of the edge of a web is detected with a Photohead that does not contact the web. The light flux from the light source is interrupted by the web edge and the electromotive force of the detector changes in proportion to the displacement of the web edge. This electromotive force is amplified to a current of ± 200 mA DC by the web guide amplifier, and is then transmitted to the moving coil of the Servoguide.

The current signal is converted into a force by the moving coil, and this force moves the spool. The force of the moving coil is balanced by the spring force when the web edge covers one half of the slit of the Photohead, and the spool is located at the center.

When the edge of a web is displaced, the electrical signal from the moving coil activates the spool of the Servoguide, and the hydraulic oil from the hydraulic pump is transmitted to the work cylinder. The work cylinder is activated to move the web in the reverse direction to the meander to perform EPC to achieve constant web edge control.

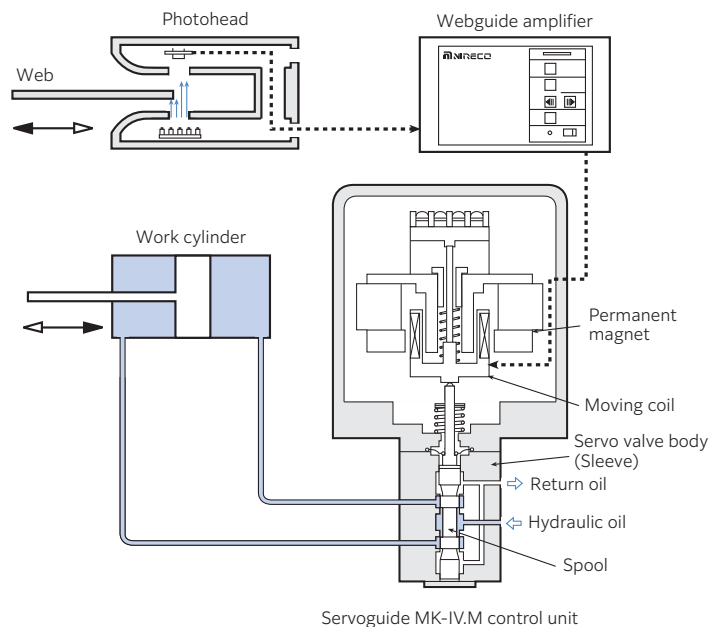


Diagram of working principle

Servoguide MK-IV.D

Pneumatic-hydraulic model

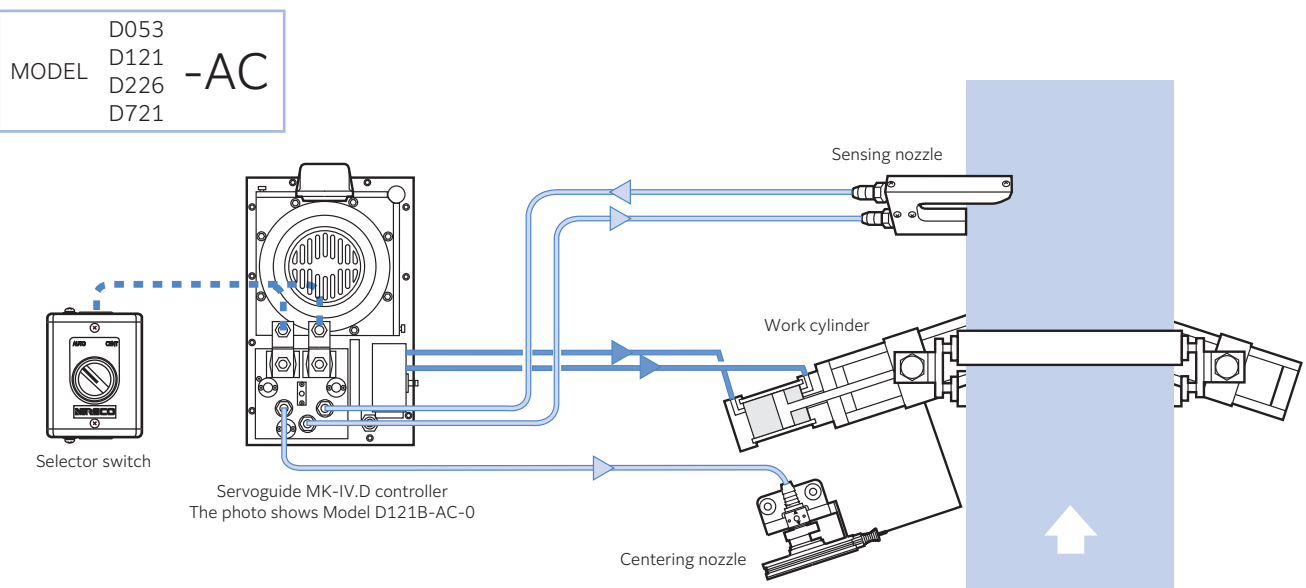
The Servoguide MK-IV.D controllers are available in many models depending on pressure and flow rate, for application at high and low web speeds and loads.

The Servoguide MK-IV.D is equipped with the added functions of Automatic / Centering operation or Automatic / Manual operation to facilitate operation control.

Examples of system configurations

- AC (AUTO-CENT) Remote AUTO-CENT switching mode

This system is available with both a centering operation and an automatic operation. The reel or the guide roller stand is automatically restored to the center position by selecting CENT with the selector switch when setting a web roll, changing the width of a web, or splicing webs.



- AM (AUTO-MAN) Remote AUTO-MAN switching mode

In this system, the Servoguide MK-IV.D controller can be remotely switched off during automatic operation or the reel stand can be manually moved right and left, when setting a web roll or splicing webs.

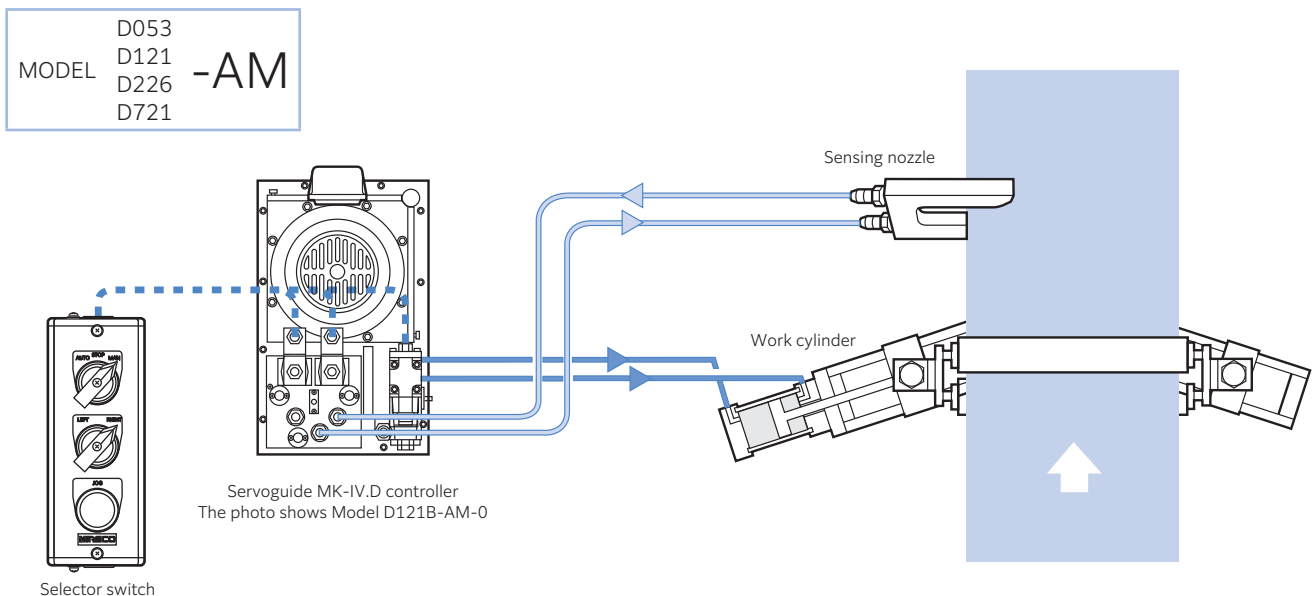


Table of controllers

MODEL	Type	Max. operating pressure MPa	Pump capacity L/min	Pump type	Motor Output kW	Max. operating force kN		Max. operating speed with no load mm/s	
						Cylinder bore mm		Cylinder bore mm	
						50	80	50	80
D053	Low load	1	2.0 (No-load)	Fixed displacement	0.2	1.9	4.9	20	8
D121	Single standard	1.5	4.2 (No-load)		0.4	2.9	7.4	34	13
D226	Twin standard	1.5	4.2 (No-load)		0.4	2.9	7.4	20	8
D721	High load	2.5 (Full cut-off 3.0)	9 (60 Hz) 7.5 (50 Hz) (No-load)	Variable displacement	0.75 (For pump) 0.2 (For blower)	—	12.3	—	30

Model codes

(Example) **D** **B** — **AM** — **0** — **0** — **0** — **N**

B	Built-in	Blower
P	Plant air (excluding D721)	
A	Auto	Driving mode
AM	Auto/Manual	
AMC	Auto/Manual/Centering	
AC	Auto/Centering	
ACS	Auto/Centering/Stop	

	Motor	Solenoid	Explosion-protection standard
0	Standard indoor type	Standard type	
1	Added-safety anti-explosion structures	Standard type	
2	Pressure-resistant anti-explosion type	Pressure-resistant anti-explosion type	
3	Added-safety anti-explosion structures	Pressure-resistant anti-explosion type	

Note: Operation mode A applies only to the motor.

0	200 V 50/60 Hz, 220 V 60 Hz	Motor power supply voltage
1	220 V 50 Hz (The D721 explosion-proof standard "0" cannot be selected.)	
2	400 V 50/60 Hz, 440 V 60 Hz (380 V 50 Hz, 415 V 50 Hz)	
X	Voltages other than those listed above are treated as "X."	

Note: Data within brackets () only applies to D053, D121 and D226 explosion-proof standard "0".

0	200 V 50/60 Hz, (220 V 60 Hz)	Solenoid power supply voltage
1	100 V 50/60 Hz, (110 V 60 Hz)	
2	110 V 50 Hz, (110 V 60 Hz)	
3	220 V 50 Hz, (220 V 60 Hz)	
4	DC 24 V	
X	Voltages other than those listed above are treated as "X."	
N	None (Only in the case of operation mode A)	

Note: Data within brackets () when explosion-proof standards "0" or "1" are selected; data within angle brackets < > when explosion-proof standards "2" or "3" are selected.

A	Pressure gauge	Option (Multiple selections allowed)
B	Cap type oil gauge	
C	Oil pan (Oil drip pan)	
D	Throttle check valve	
F	Filter (D721 is a standard feature)	
N	A case without an option.	

Parts not represented by a model number (optional parts)

Description	Remarks	Drawing No.
Air pressure gauge for checking	0 to 7 kPa	AD6234.0-JA
Decompression device for plant air models	RD-G	FH9024.1-JA
Selector switch	Auto/Centering	MW8044.1-EA
	Auto/Manual	MW8045.1-EA
	Auto/Manual/Centering	MW0000080-JA
Explosion-proof switch	Auto/Centering	MW8017.1-EA
	Auto/Manual	MW8019.2-EA
	Auto/Manual/Centering	BS8086.0-JA

MODEL D053 (Low-load type)

Pneumatic-hydraulic model

Model D053, priced lowest among the Servoguide series, is a controller for low loads.

Motor	Select the power supply depending on the specifications (see model symbols on p. 18) 3-phase, 0.2 kW, 2-pole, totally enclosed fan-cooled type
Electromagnetic valve	Select the power supply according to the specifications (single phase) (see model symbols on p. 18)
Max. operating pressure	1.0 MPa
Pump capacity	2.0 L/min (50 Hz)
Air pressure	4 kPa
Ambient temperature	-10 to +40°C
Oil required	12 L
Hydraulic fluid	Regulator oil 46 or equivalent
Viscosity of hydraulic fluid during operation	Approx. 20 to 80 cSt
Mass	A: Approx. 30 kg, AC: Approx. 31 kg, AM: Approx. 33 kg, ACS: Approx. 33 kg, AMC: Approx. 35 kg, (excluding oil)
Installation	Horizontal



MODEL D053B-AM-0

MODEL D121 (Single type)

Pneumatic-hydraulic model

Model D121 is the standard model of the Servoguide MK-IV series, which can be used for most machines.

Motor	Select the power supply depending on the specifications (see model symbols on p. 18) 3-phase, 0.4 kW, 2-pole, totally enclosed fan-cooled type
Electromagnetic valve	Select the power supply according to the specifications (single phase) (see model symbols on p. 18)
Max. operating pressure	1.5 MPa
Pump capacity	4.2 L/min (50 Hz)
Air pressure	4 kPa
Ambient temperature	-10 to +40°C
Oil required	12 L
Hydraulic fluid	Regulator oil 46 or equivalent
Viscosity of hydraulic fluid during operation	Approx. 20 to 80 cSt
Mass	A: Approx. 30 kg, AC: Approx. 31 kg, AM: Approx. 33 kg, ACS: Approx. 33 kg, AMC: Approx. 35 kg, (excluding oil)
Installation	Horizontal



MODEL D121B-AC-0

MODEL D226 (Twin type)

Pneumatic-hydraulic model

Two Servoguide MK-IV controllers are mounted on one hydraulic pump unit in the model D226. Economical and compact instrumentation can be obtained when more than one EPC system(eg. laminator line, multi-stage guide roll, etc.) is installed nearby.

Motor	Select the power supply depending on the specifications (see model symbols on p. 18) 3-phase, 0.4 kW, 2-pole, totally enclosed fan-cooled type
Electromagnetic valve	Select the power supply according to the specifications (single phase) (see model symbols on p. 18)
Max. operating pressure	1.5 MPa
Pump capacity (No load)	4.2 L/min (50 Hz)
Air pressure	4 kPa
Ambient temperature	-10 to +40°C
Oil required	26 L
Hydraulic fluid	Regulator oil 46 or equivalent
Viscosity of hydraulic fluid during operation	Approx. 20 to 80 cSt
Mass	A: Approx. 40 kg, AC: Approx. 42 kg, AM: Approx. 44 kg, ACS: Approx. 44 kg, AMC: Approx. 46 kg, (excluding oil)
Installation	Horizontal



MODEL D226B-AC-0

MODEL D721 (High-load type)

Pneumatic-hydraulic model

The Model D721 is a high-powered Servoguide which can be used for high loads and high-speed lines.

Motor	Select the power supply depending on the specifications (see model symbols on p. 18) For hydraulic pump: 3-phase, 0.75 kW, 4-pole, totally enclosed fan-cooled type For blower: 3-phase, 0.4 kW, 2-pole, totally enclosed fan-cooled type
Electromagnetic valve	Select the power supply according to the specifications (single phase) (see model symbols on p. 18)
Max. operating pressure	2.5 MPa (Full cut-off 3.0)
Pump capacity (No load)	7.5 L/min (50 Hz), 9 L/min (60 Hz)
Air pressure	4 kPa
Ambient temperature	-10 to +40°C
Oil required	26 L
Hydraulic fluid	Regulator oil 46 or equivalent
Viscosity of hydraulic fluid during operation	Approx. 20 to 80 cSt
Mass	A: Approx. 55 kg, AC: Approx. 56 kg, AM: Approx. 58 kg, ACS: Approx. 58 kg, AMC: Approx. 60 kg, (excluding oil)
Installation	Horizontal



MODEL D721B-AM-0

D053 ☐ **A**
D121 ☐ **AM**
D226 ☐ **AMC**
D721 ☐ **AC**

Pneumatic-hydraulic model

MODEL **D721** ☐ - **ACS - 2 (3) Pressure-resistant explosion-proof type**

The Servoguide MK-IV.D is mounted with pressure-resistant explosion-proof electromagnetic valves and motors, making sure that it can be used safely in locations where explosive gases are Present.

MODEL	Application	Motor output
D053 <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> -2 (3)	Light load type	0.4 kW
D121 <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> -2 (3)	Single type	0.4 kW
D226 <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> -2 (3)	Single type	0.4 kW
D721 <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> -2 (3)	High-strength type	0.75 kW/0.4 kW



MODEL D121B-AM-2

Servoguide MK-IV.M

Electric-hydraulic model

The Servoguide MK-IV. M is composed of a sensor, amplifier, controller, work cylinder, and guide rollers or a reel stand. This system can be applied to a wide range of objects with the various sensors available.

Example of system configurations

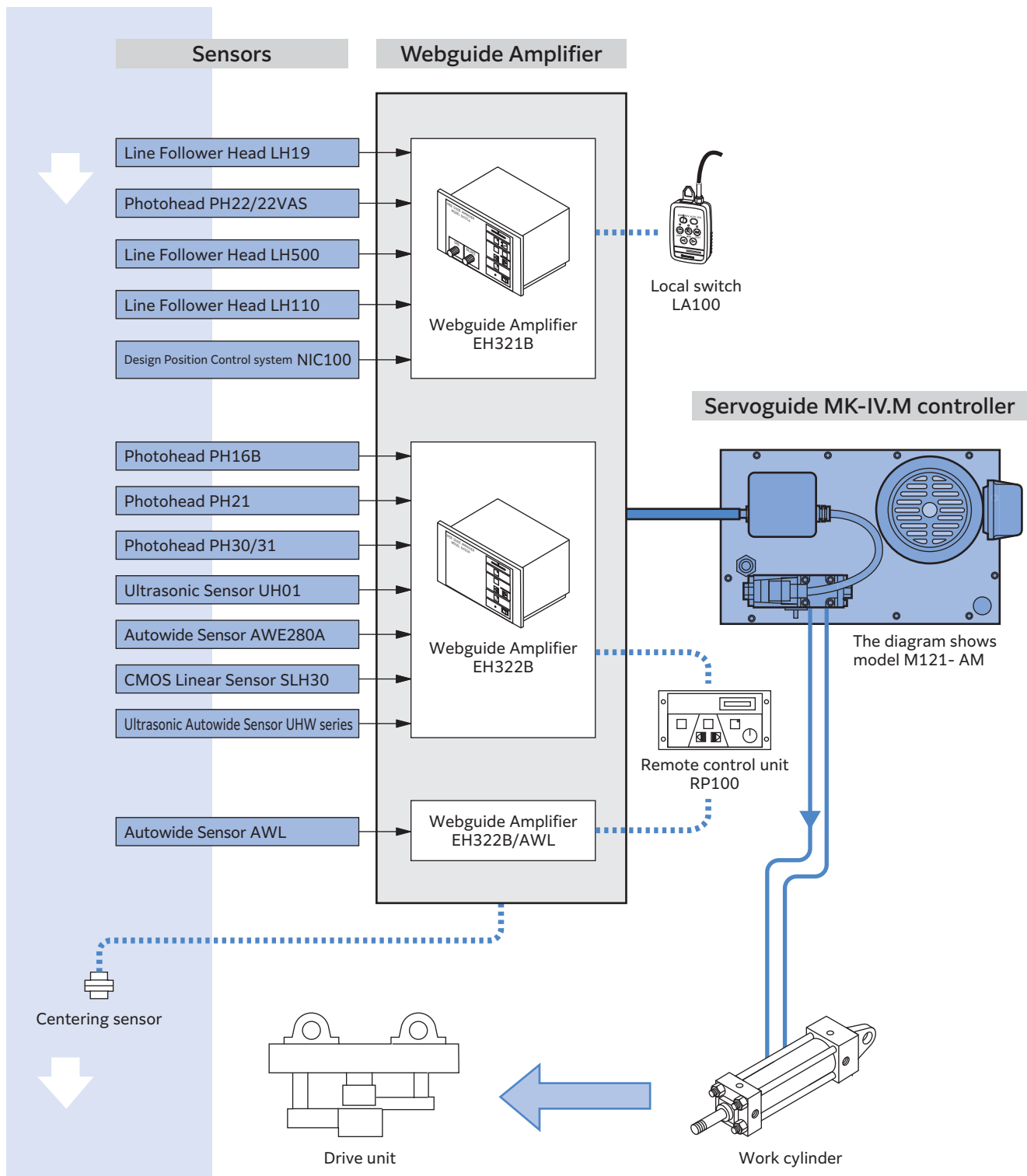


Table of controllers

MODEL	Type	Max operating pressure MPa	Pump capacity L/min		Pump type	Motor Output kW	Max. operating force kN Cylinder bore mm		Max. operating speed with no load mm/s Cylinder bore mm	
							50	80	50	80
M121-AM	Single standard	1.5	4.2		Fix displacement	0.4	2.9	7.4	34	13
M220-AM	Twin standard	1.3 (Full cut-off 1.5)	9 (60 Hz) 7.5 (50 Hz)	No load	Variable	0.75	2.9	7.4	34	13
M721-AM	High load	2.5 (Full cut-off 3.0)	9 (60 Hz) 7.5 (50 Hz)	No load		0.75	-	12.3	-	30

Model codes

(Example) **M** — **AM** — **0** — **0** — **0** — **N**

	Motor	Solenoid	Explosion-protection standard
0	Standard indoor type	Standard type	
1	Added-safety anti-explosion structures	Standard type	
2	Pressure-resistant anti-explosion type	Pressure-resistant anti-explosion type	
3	Added-safety anti-explosion structures	Pressure-resistant anti-explosion type	

	Motor power supply voltage	Motor power supply voltage
0	200 V 50/60 Hz, 220 V 60 Hz	
1	220 V 50 Hz (The M220 and M721 explosion-proof standard "0" cannot be selected.)	
2	400 V 50/60 Hz, 440 V 60 Hz (380 V 50 Hz, 415 V 50 Hz)	
X	Voltages other than those listed above are treated as "X."	

Note: Data within brackets () only applies to D053, D121 and D226 explosion-proof standard "0".

	Solenoid power supply voltage	Solenoid power supply voltage
0	200 V 50/60 Hz, (220 V 60 Hz)	
1	100 V 50/60 Hz, (110 V 60 Hz)	
2	110 V 50 Hz, (110 V 60 Hz)	
3	220 V 50 Hz, (220 V 60 Hz)	
4	DC 24 V	
X	Voltages other than those listed above are treated as "X."	

Note: Data within brackets () when explosion-proof standards "0" or "1" are selected; data within angle brackets < > when explosion-proof standards "2" or "3" are selected.

	Option (Multiple selections allowed)	Option (Multiple selections allowed)
A	Pressure gauge	
B	Cap type oil gauge	
C	Oil pan (Oil drip pan)	
D	Throttle check valve	
F	Filter (D721 is a standard feature)	
N	A case without an option.	

(Example) **M510** — **AM** — **0**

	Solenoid power supply voltage	Solenoid power supply voltage
0	200 V 50/60 Hz 220 V 60 Hz	
1	100 V 50/60 Hz 110 V 60 Hz	
2	110 V 50 Hz	
3	220 V 50 Hz	
4	DC 24 V	
N	None	
X	Voltages other than those listed above are treated as "X."	

MODEL **M121** (Single type)

Electric-hydraulic model

The Model M121-AM receives an electric signal from the Webguide Amplifier and converts it into a hydraulic control signal. In this model, one Servoguide MK-IV. M controller is mounted in the hydraulic pump unit. The model is equipped with an AUTO / MAN selecting function, which enables the Servoguide MK-IV. M to be changed over from automatic operation to manual operation and the reel stand etc., to be moved right or left manually.

Input	-200 to 0 to +200 mA DC (Coil resistance: approximately 20 Ω)
Motor	Select the power supply depending on the specifications (see model symbols on p. 23) 3-phase, 0.4 kW, 4-pole, totally enclosed, fan-cooled
Electromagnetic valve	Select the power supply according to the specifications (single phase) (see model symbols on p. 23)
Max. operating pressure	1.5 MPa
Pump capacity (No load)	4.2 L/min (50 Hz)
Ambient temperature	-10 to +40°C
Hydraulic fluid	Regulator Oil 46 or equivalent
Viscosity of hydraulic fluid during operation	Approx. 20 to 80 cSt
Oil required	12 L
Mass	32 kg (excluding oil)
Installation	Horizontal



MODEL **M220** (Twin type)

Electric-hydraulic model

Two Servoguide MK-IV. M controllers are mounted on one hydraulic pump unit in the model M220. You can obtain economical and compact instrumentation when more than one EPC system such as a laminator line or a multi-stage guide roll is installed nearby.

Input	-200 to 0 to +200 mA DC (Coil resistance: approximately 20 Ω)
Motor	Select the power supply depending on the specifications (see model symbols on p. 23) 3-phase, 0.4 kW, 4-pole, totally enclosed, fan-cooled
Electromagnetic valve	Select the power supply according to the specifications (single phase) (see model symbols on p. 23)
Max. operating pressure	1.3 MPa (Full cut-off 1.5 MPa)
Pump capacity (No load)	9 L/min (60 Hz), 7.5 L/min (50 Hz)
Ambient temperature	-10 to +40°C
Hydraulic fluid	Regulator oil 46 or equivalent
Viscosity of hydraulic fluid during operation	Approx. 20 to 80 cSt
Oil required	26 L
Mass	53 kg (excluding oil)
Installation	Horizontal



MODEL M721-AM (High-load type)

Electric-hydraulic model

Model M721-AM is a high-power Servoguide which can be applied to high loads and high speed lines.

Input	-250 to 0 +250 mA DC (Coil resistance: approximately 20 Ω)
Motor	Select the power supply depending on the specifications (see model symbols on p. 23) 3-phase, 0.75 kW, 4-pole, totally enclosed, fan-cooled
Electromagnetic valve	Select the power supply according to the specifications (single phase) (see model symbols on p. 23)
Max. operating pressure	2.5 MPa (Full cut-off 3.0 MPa)
Pump capacity (No load)	9 L/min (60 Hz), 7.5 L/min (50 Hz)
Ambient temperature	-10 to +40°C
Hydraulic fluid	Regulator Oil 46 or equivalent
Viscosity of hydraulic fluid during operation	Approx. 20 to 80 cSt
Oil required	26 L
Mass	Approx. 49 kg (excluding oil)
Installation	Horizontal

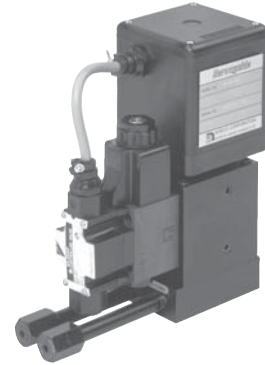


MODEL M510-AM (Controller element high-pressure, high-precision type)

Electric-hydraulic model

This is a single controller without the hydraulic unit.

Input	-250 to 0 +250 mA DC (Coil resistance: approximately 20 Ω)
Electromagnetic valve	Select the power supply according to the specifications (see model symbols on p. 23)
Max. operating pressure	5.0 MPa
Pump capacity (No load)	9 L/min
Ambient temperature	-10 to +40°C
Hydraulic fluid	Regulator Oil 46 or equivalent
Viscosity of hydraulic fluid during operation	Approx. 20 to 80 cSt
Mass	6 kg (excluding oil)
Installation	Horizontal



Power Guide Unit

MODEL M820-AM (High-output/High-response type)

Electric-hydraulic model

The Model M820-AM controller incorporates our industrial servo valves (Powerguide valves), giving it a greater power output and responsiveness than other models.

Input	-200 to 0 to +200 mA DC (Coil resistance: approximately 20 Ω)
Motor	The power supply depends on the specifications. 3-phase, 1.5 kW, 4-pole, totally enclosed, fan-cooled
Electromagnetic valve	Select the power supply according to the specifications (single phase)
Max. operating pressure	5.0 MPa (Full cut-off 6.0 MPa)
Pump capacity (No load)	12.5 L/min (60 Hz), 10.5 L/min (50 Hz)
Pump type	No load
Max. operating force	24.6 kN (Cylinder bore 80 mm)
Max. operating speed with no load	60 mm/s (Cylinder bore 80 mm)
Ambient temperature	-10 to +40°C
Hydraulic fluid	Regulator Oil 46 or equivalent
Viscosity of hydraulic fluid during operation	Approx. 20 to 80 cSt
Oil required	26 L
Mass	Approx. 65 kg (excluding oil)
Installation	Horizontal



Related devices

Webguide Amplifiers EH321B / EH322B / EH322B/AWL

Electric-hydraulic models

The Webguide Amplifier amplifies signals from the sensors to operate the Servoguide controller, and also functions as a controller. Changeover between automatic and manual operation can be done via the manual operation push-button switch. Three models are available, depending on the type of sensor.



Web Guide Amplifier EH321B



Web Guide Amplifier EH322B

Note: The dimensions of the EH322B and the EH322B/AWL are the same as above except for the front panel

General

Control output	-200 to 0 to +200 mA DC (load 20 Ω , moving coil) (max. \pm 250 mA DC) Dither: 4 Vp-p, 50/100 Hz rectangular wave
Power supply voltage	100 to 240 V AC, automatic changeover, 50/60 Hz
Power consumption	100 VA
Solenoid valve*	Power supply voltage
Ambient temperature	-10 to +50°C
Ambient humidity	35-85% RH (no condensation)
Installation	Shelf, wall mounting, or panel
Mass	5 kg

* The voltage for the power supply to this unit and to the Servoguide solenoid must be the same.

Specification by model

Model	EH321B	EH322B	EH322B/AWL
Input	Sensor	LH19, PH22, LH110, LH500, NIC100	PH16B, PH21, PH30N, PH31N, UH01, AWE280A, SLH30, UHW
	Centering sensor	SI12-NE4	
	Remote control head	LA100	RP100
	Fine adjuster	-	2 k Ω (Potensiometer)
	Position transmitter	-	2 k Ω (Potensiometer)
Output	Lamp power supply	6 V DC, 5 W	6 V DC, 5 W, 12 V DC, 10 W

Local switch LA100

The LA100 hand switch lets you operate the Liteguide Controller and the Webguide Amplifier remotely. You can use the LA100 hand switch to control each operation (switching control mode, shifting control position, controlling the auto balance and switching between NOR and REV directions).

Power supply	Receives power from the AE1000, AE500 and EH321B
Ambient temperature	0 to +50°C
Ambient humidity	35-85% RH (no condensation)
Protective structure rating	IP50
Cable length	5 m
Mass	0.8 kg



Remote control unit RP100

The RP100 remote control unit lets you operate the Liteguide Controller and the Webguide Amplifiers remotely. You can use the RP100 to control each operation of the Liteguide controller (operations in the control mode and shifting the control position).



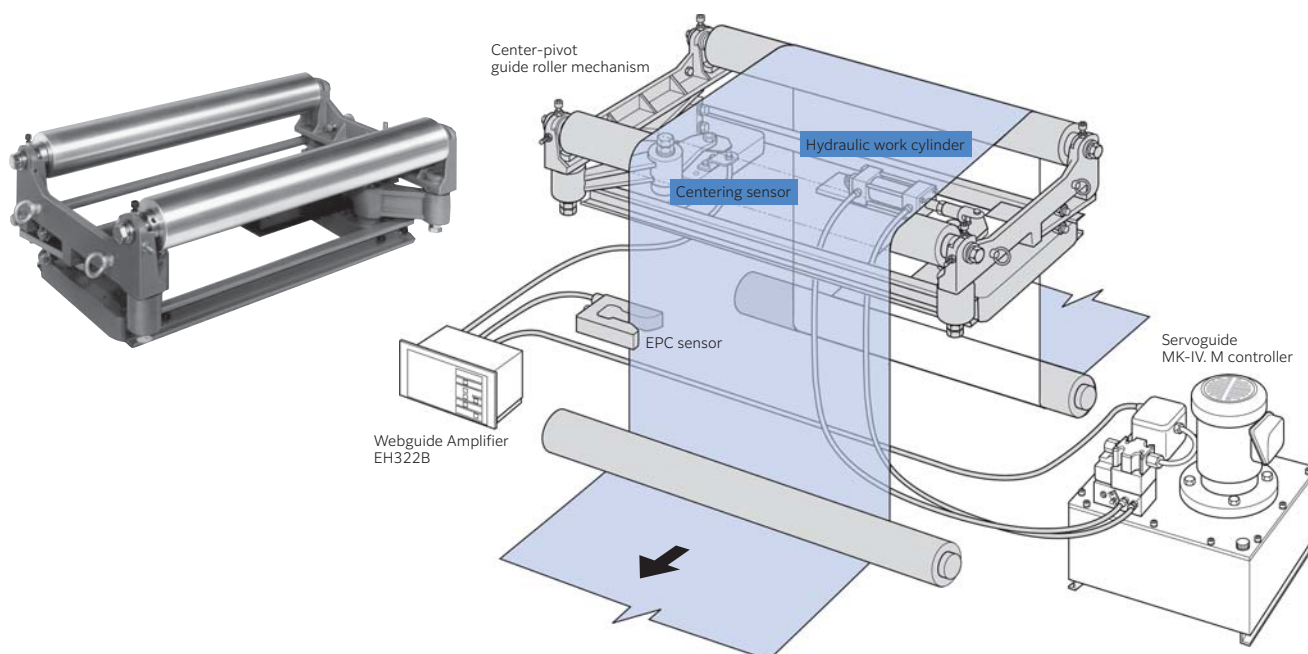
Power supply	Receives power from the AE1000, AE500 and EH322B
Ambient temperature	0 to +50°C
Ambient humidity	35-85% RH (no condensation)
Protective structure rating	IP50
Cable length	20 m
Mass	0.7 kg

Guide roller mechanisms (hydraulic)

This guide roller mechanism corrects web meandering. There are two basic guide roller control methods: the center pivot method and the end pivot method. Nireco, based on many years of experience with EPC technology, has selected the optimal guide roller mechanism for the web material, width, tension, amount of web correction, speed, as well as the machine installation conditions. We offer these roller mechanisms to our customers.

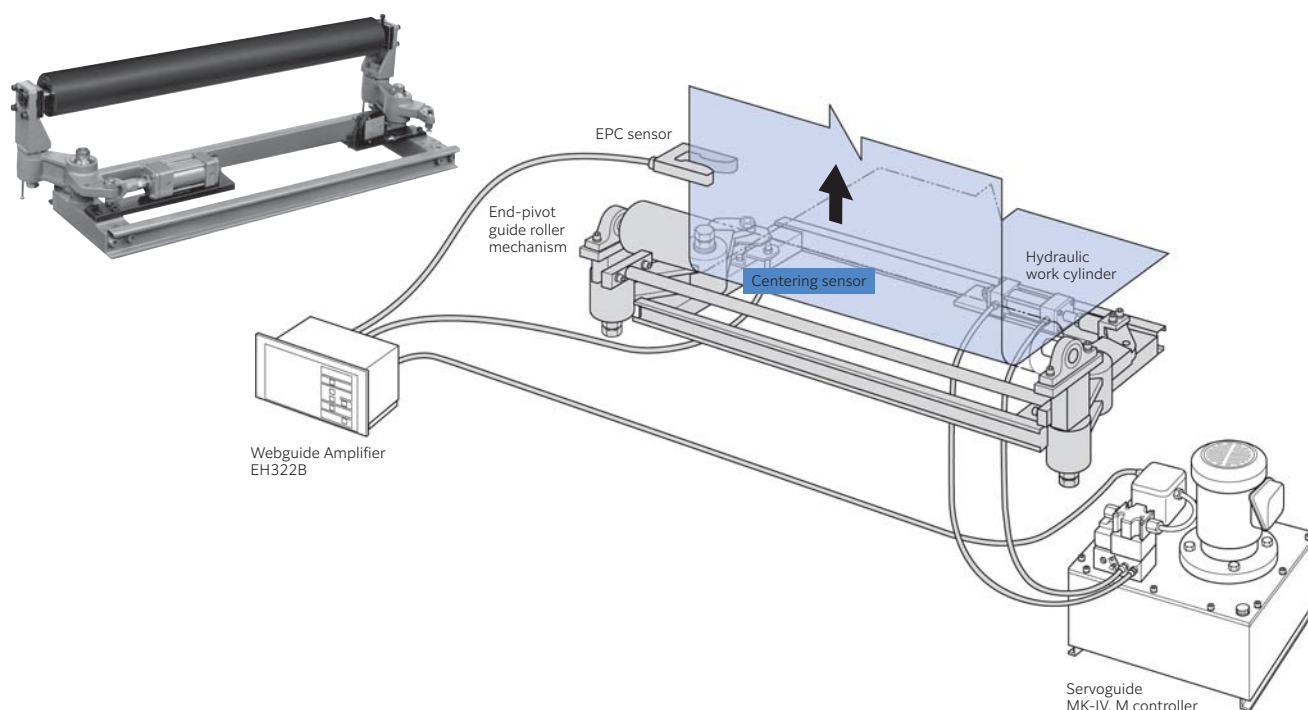
Center-pivot guide roller mechanism (GCD model)

The guide roller mechanism on a center pivot is designed so that the center of the web plane extension on the guide roller inlet side is the center of rotation. This guide roller system is used for web grades that can suffer permanent deformation or wrinkles when a difference in tension arises between both edges, i.e. non-expansion paper, newspaper, coated paper, metal, foil, cellulose, acetate, and brittle plastics.



End-pivot guide roller mechanism (GED model)

The guide roll mechanism based in an end pivot is available with one, two or three rollers. The number of rollers is selected according to the place of use. This guide roller mechanism is used for webs that are expandable and easily absorb a difference in tension between both edges, i.e. cellophane, vinyl and polyethylene. It has the advantage of relatively easy installation in the middle of a line.



Work cylinder

The work cylinder is used for driving a unwinding reel, rewinding reel or guide roller mechanism. Although standard clevis work cylinders are used, foot-, flange- and trunnion-types can also be supplied on request.



Pressure gauges

Purchase one of each for maintenance, regardless of the number of machines, so that you can check pressures.



Oil pressure gauge



Air pressure gauge
(for Mk-IV.D)

Selector switches

Three types of selector switch are available for the Servoguide MK-IV.D: for AM, AC, and AMC applications. The switch for AM allows the operator (from a remote position) to select AUTO, STOP or to move the reel stand to the left or right. The switch for AC allows the operator (from a remote position) to give a command to automatically move the reel stand back to its central position, when setting the web.

The switch for AMC can be used for both of these functions.

Furthermore, we offer two types of these switches: the standard version and a pressure-resistant explosion-proof version.

• Standard specification



AM selector switch



AC selector switch

• Pressure-resistant explosion-proof specification



AM selector switch



AC selector switch

Cap-type oil gauge

A convenient oil gauge which allows the oil amount in the tank to be checked from the outside during daily maintenance inspections.



Oil pan

Oil pan for regulator equipment. We offer two types according to tank capacity.



Centering sensor SI12-NE4

This sensor is set up with the winding/unwinding reel in its central position. It is a position sensor that is used to keep the guide roller in its center position.



Detecting length	Approx. 3 mm	
Standard object	Ferrous material 12×12×1t or more	
Applicable objects	Ferrous/non-ferrous material	
Rated operating	Rated voltage	8 V DC (R1=1 kΩ)
	Allowable ripple rate	Less than 10%
	Repetitive error	Less than 3%
	Temperature characteristics	±10% within
	Unevenness of the movement distance	±10% within
	Operating current	Non-detection: 3 mA or more Detection: Less than 1 mA
	Hysteresis	1~10%
Resistance to environment	IP67	
Allowable wiring resistance	Total resistance: 1000 Ω or less	
Ambient temperature	-25 to +60°C	
Ambient humidity	10-85% RH (no condensation)	
Protective structure rating	IP67	
Case material	Nickel brass	
Cable	PVC 2 m±10%	
	D (ø4.2), P (2), q (0.25 mm ²)	
Tightening torque	Less than 12 Nm	
Mass	140 g	

Centering nozzle CN12 (for the MK.IV.D))

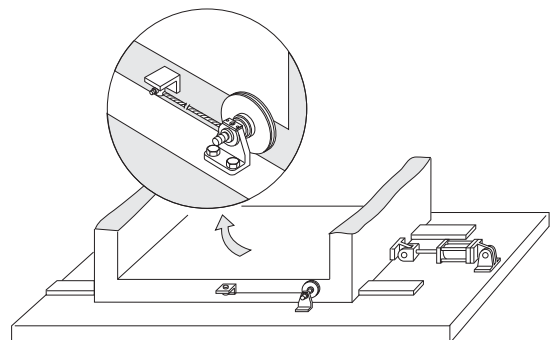
Pneumatic-hydraulic model

This center-position sensor can be used to maintain the winding and unwinding reels in central positions, and center the guide rollers when web threading. Setting the selector switch to CENT switches off the signal voltage from the measurement nozzle so that only the air pressure from the blower is transmitted to the Servoguide MK-IV diaphragm. Air is discharged to operate the cylinder until the center position of the reel and guide roller is maintained constantly.



Centering nozzle mounting direction

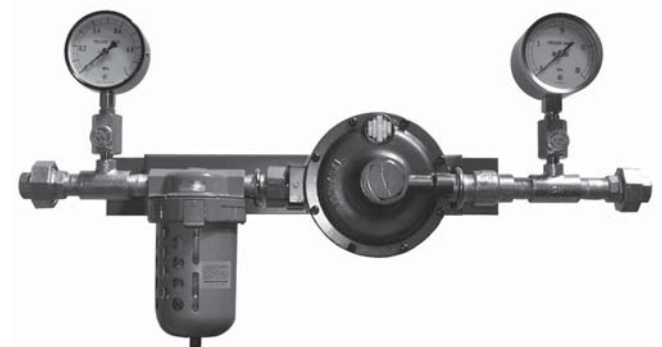
	Measurement nozzle direction	Centering nozzle direction
Rewind type Guide roller type		
Wind type		



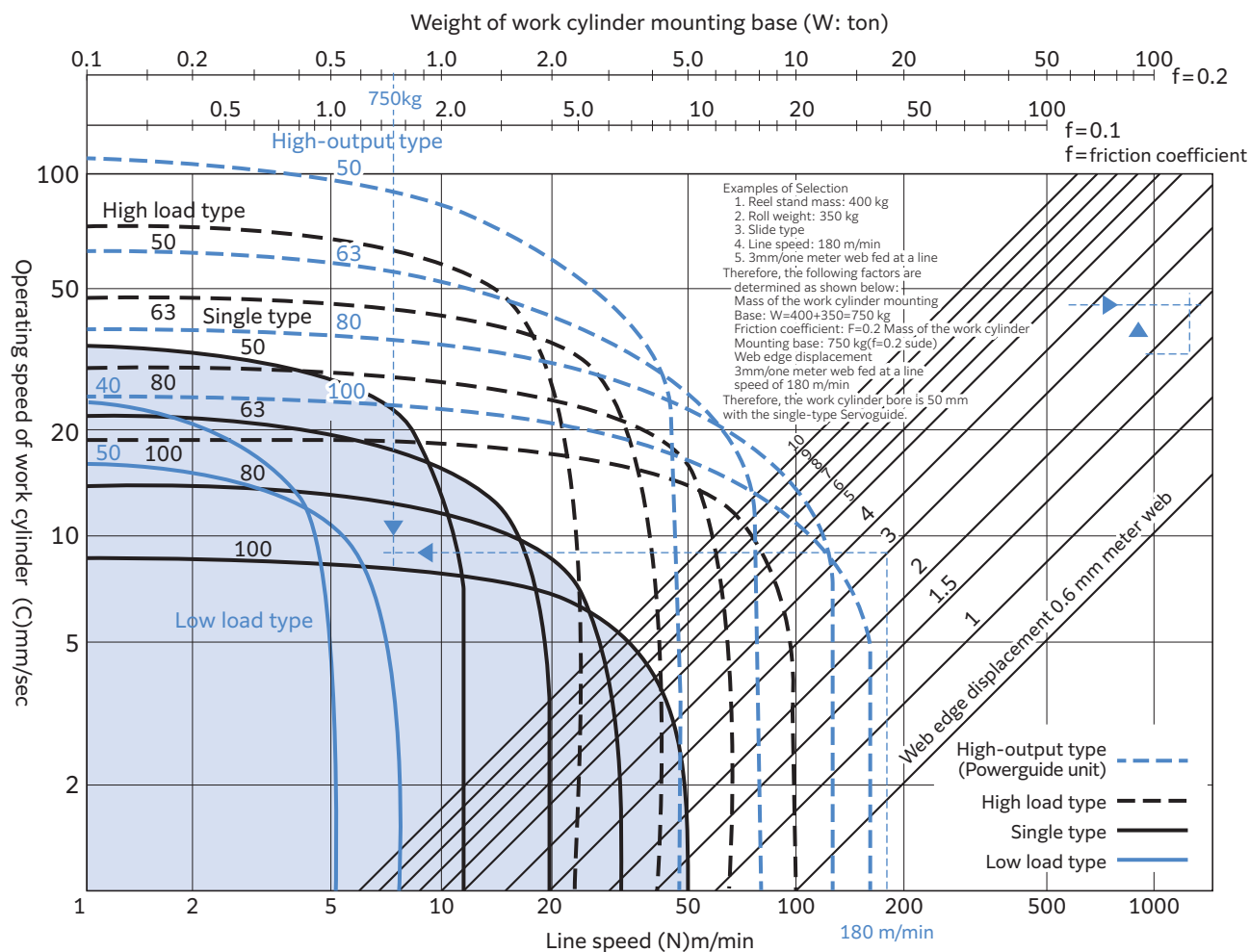
Mounting diagram

Decompression device RD-G (optional) for plant air Servoguides

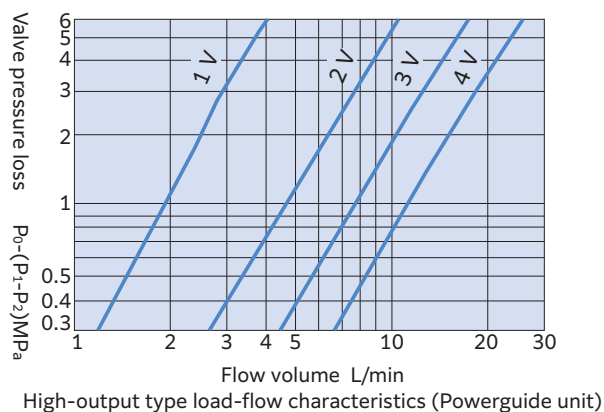
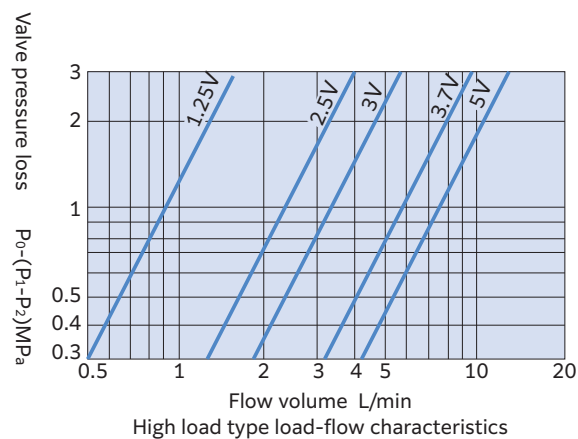
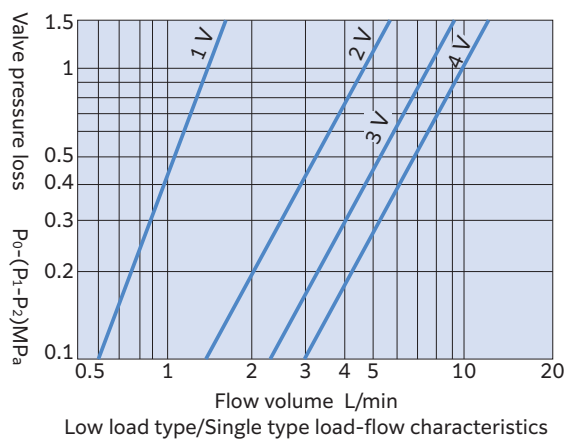
A device to reduce air pressure supplied from the primary side to the pressure setting of the secondary side. There are attached pressure gauges for both the primary and secondary sides which are extremely useful for checks, adjustments and other operations.



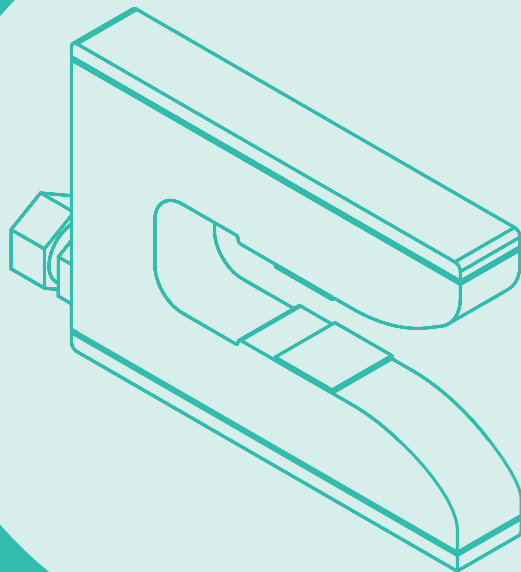
Servoguide MK-IV model selection table



Servoguide MK-IV load-flow characteristics



Sensors



Sensors

Table of sensors

Item	Model	Product name	Lights, element	Application & features	Objects sensed
1	PH16B	Photohead	LED, SPD	Opaque webs	Edges
2	PH21	Photohead	LED, SPD	Opaque webs (a compact version of the PH16)	Edges
3	PH22	Photohead	LED, SPD	Reflective, opaque, transparent webs; nonwoven fabrics	Edges
4	PH22 Model for vacuum environments	Photohead	LED, SPD	Reflective, opaque, transparent webs; nonwoven fabrics	Edges
5	LH19	Line Follower Head	LED, SPD	Reflective, opaque, transparent webs	Lines, edges
6	LH110	Line Follower Head	LED, CCD	Digital detection; opaque, transparent webs	Lines, edges
7	LH500	Line Follower Head	LED, CCD	Digital detection; pattern matching; opaque, transparent webs	Lines, edges
8	NIP/NIC	Design Position Control system	LED CCD area sensor	Digital detection; pattern matching; opaque, transparent webs; image display	Lines, edges, patterns
9	PH30, 31	Photohead	Lamp, SPD	Opaque webs; wide distances between projector and receiver	Edges
10	UH01*	Ultrasonic Sensor	Ultrasonic	Ultrasonic applications; opaque, transparent webs; photo-sensitive materials	Edges
11	AWE280A	Autowide Sensor	LED, CIS	Digital detection; opaque webs; nonwoven fabrics, lattice-like webs; wide fields of view	Edges, center of web
12	AWL	Autowide Sensor	LED, SPD	Opaque webs; wide fields of view; wide distances between projector and receiver	Center of web
13	LSE4096	Linear Sensor	Fluorescent lamp, CCD	Digital detection; opaque webs; wide fields of view	Edges, center of web
14	SLH30	CMOS Linear Sensor	LED, CMOS	Digital detection; transparent, opaque webs; nonwoven fabrics; lattice-like webs	Edges
15	UHW	Ultrasonic Autowide Sensor	Ultrasonic	Opaque webs; wide fields of view	Edges, center of web
16	HE120A	High Temperature EPC Sensor	LED, SPD	Transparent, opaque webs; high temperatures (can withstand 300°C)	Edges
17	FW22/31/80	Analog Position Transmitter	Wire potentiometer type	Necessary for use in proportional operation	Position of final control element

* We also offer an explosion-proof S-type version.

Photohead PH16B

The Photohead photoelectrically detects the web edge. As a pulsed infrared light emitting diode (LED) is used as the light source, the Photohead can be applied for a web such as photosensitive paper, which is adversely affected by light.



Sensor gap	28 mm
Range of measurement	±4 mm
Light source	LED
Light source wavelength	950 nm (near infrared)
Sensitivity	0.1 mm of displacement of web
Maximum output	300 mV DC, ± 20%
Detection element	SPD
Power supply	DC11 V 37 mA
Ambient temperature	0 to + 50 °C
Ambient humidity	35-85% RH (no condensation)
Protective structure rating	IP50
Body material	Aluminum alloy die casting
Mass	Head: 1 kg (including the cable) Screw guider: 0.5 kg

Photohead PH21

The Photohead PH21 photoelectrically detects the web edge.

This sensor is a miniaturized model of PH16B, but with the same functions.



Sensor gap	10 mm
Range of measurement	±4 mm
Light source	LED 12 V DC
Light source wavelength	950 nm
Sensitivity	0.1 mm of displacement of web
Maximum output	300 mV DC, ± 20%
Detection element	SPD
Power supply	DC11 V 37 mA
Ambient temperature	0 to +50°C
Ambient humidity	35-85% RH (no condensation)
Protective structure rating	IP50
Body material	Conductive plastic
Mass	Head: 0.5 kg (including the cable) Screw guider: 0.5 kg

Photohead PH22

The Photohead PH22 is a sensor designed to detect a transparent web or a nonwoven fabric in EPC. The sensor uses an SPD as the detector element and a white LED as the light source, for long-term, stable meandering detection.



- Detects even a slight displacement of web by emitting light with uniform intensity.
- Use of SPD enables faster reaction and improves the detection accuracy for high-speed operations.
- Detects a 0.1mm displacement of web.
- Use of white LED for the light source enables a long time, stable operation and helps to reduce cost.

Spotlight Distance	32 mm
Detection field of view	6 mm
Light source	White LED
Light source wavelength	Visible Light
Sensitivity	0.1 mm of displacement of web
Output voltage	0 to 5 V DC
Detection element	SPD
Power supply	±15 V DC
Ambient temperature	0 to +50°C
Ambient humidity	35-85% RH (no condensation)
Protective structure rating	IP50
Response frequency	Filter ON 3 Hz (PH20A equivalent) Filter OFF 30 Hz
Body material	Cast Aluminum Alloy
Mass	Head: 450 g Cable: 250 g

Photohead PH22VAS for vacuum environments

The PH22VAS is an EPC sensor designed to be installed in a vacuum environment.

Its airtight design prevents component degradation within the sensor and stops outgassing. This design also prolongs the life of the sensor in a corrosive gas environment.



- Applicable to vacuum environment
- Sealing structure prevents outgassing
- Corrosive gas resistant
- For various web materials (transparent, opaque, and non-woven etc.)
- Installable in a vacuum chamber. Machinery cost can be reduced

Light-emitting and light-receiving gap	22 mm
Detection field of view	6 mm
Light source	White LED
Light source wavelength	Visible Light
Sensitivity	Can detect a 0.1 mm displacement in a transparent web
Output voltage	0 to 4 V DC (depends on the web material)
Detection element	SPD
Power supply	±15 V DC
Ambient temperature	0 to +50°C
Ambient humidity	35-85% RH (no condensation)
Protective structure rating	IP60 (when installed)
Response frequency	30 Hz
Body material	Aluminum alloy and stainless steel
Mass	1.3 kg

Line Follower Head LH19

The Line Follower Head LH19 is a sensor which optically detects the meandering of register lines or patterns printed on webs or the edges of webs. This meander sensor can be used safely for a long time because it uses an SPD as the sensing element and a white LED as the light source.



- With an SPD, response speed is increased and sensing accuracy during high-speed operation is improved.
- Spot diameter can be adjusted easily with the slide control without changing the sensing distance.
- A white LED is used as the light source, which secures long and stable operation and reduces the spare parts cost.

Sensor gap	10 mm
Range of measurement	5 to 3 mm (spot diameter)
Register line width	1.0 mm or more
Light source	White LED
Light source wavelength	Visible light
Sensitivity	0.1 mm of displacement of web
Output voltage	0 to 5V DC
Detection element	SPD
Power supply	±15V DC
Ambient temperature	0 to +50°C
Ambient humidity	35-85% RH (no condensation)
Protective structure rating	IP50
Body material	Cast aluminum alloy
Mass	Head: 450 g Cable: 250 g

Line Follower Head LH110

Optically detects register lines or patterns printed on the web and on the edge of the web. LPC or EPC systems can be created by combining the LH10 and a Liteguide Controller.

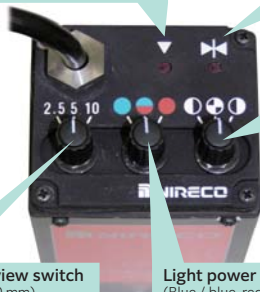
User-friendly display and functions

Focus indicator lamp

This lamp lights when the mounting distance and angle between the LH110 and the web are correct and the head is focused.

Center indicator lamp

This lamp lights when the edge of the web or edge of the line is in the center of the field of view of the LH110.



Light color layout switch

Select which edge of the line to detect by switching the contrast between the web material and the line.

Field of view switch

(2.5 / 5 / 10 mm)
This switch can change the field of view (detection range).

Light power switch

(Blue / blue-red / red)
This switch can change the emitted light color.



- When detecting a wide width line or pattern edge, there is no need to switch between the edge and line.
- The change in output voltage for line (edge) deviation is not influenced by line width or color; therefore, once the gain of the controller is set during a trial run, it is not necessary to readjust the gain.
- During the interval when a line (edge) leaves the view field to when it returns, the position signal generated immediately before the line (edge) leaves the view field is retained and output. Therefore, a follow-up operation can be performed when the meander speed of a web is fast and the line (edge) tends to be out of the view field.
- Focus indicator lamps when the focal distance is correct and the mounting interval between the path line and detector are appropriate.
- When the edge (or edge of the line) to be detected is in the center of the field of view, the center indicator lamp lights.
- When the device is connected to a controller that has an actuator lock contact input, (in cases of intermittent lines) the actuator is locked when the break in the line is detected and follow-up operation is stopped until the next line appears.

Note: The position signal retention function is not available when an actuator lock signal output is used.

Light emission distance	1 mm (from the scattering plate)	
Detection view field	2.5 / 5 / 10 mm (switch between these)	
Light source	High luminance LED (2 colors: blue and red)	
Output volatage	Position signal	0 to +5 V DC (high), 0 to +0.5 V DC (low)
	Actuator lock signal	Open collector 30 V, 0.1 A or less ON without line (edge)
Resolution	14 μm	
Detection element	CCD linear image sensor	
Power supply	+15 V DC, 300 mA / -15 V DC, 50 mA	
Ambient temperature	0 to +50°C	
Ambient humidity	35-85% RH (no condensation)	
Protective structure rating	IP50	
Body material	AC4C	
Mass	Head: 0.6 kg (including the cable) Screw guider: 0.5 kg	

Line Follower Head LH500

The latest imaging technology to keep slit failures to an absolute minimum.

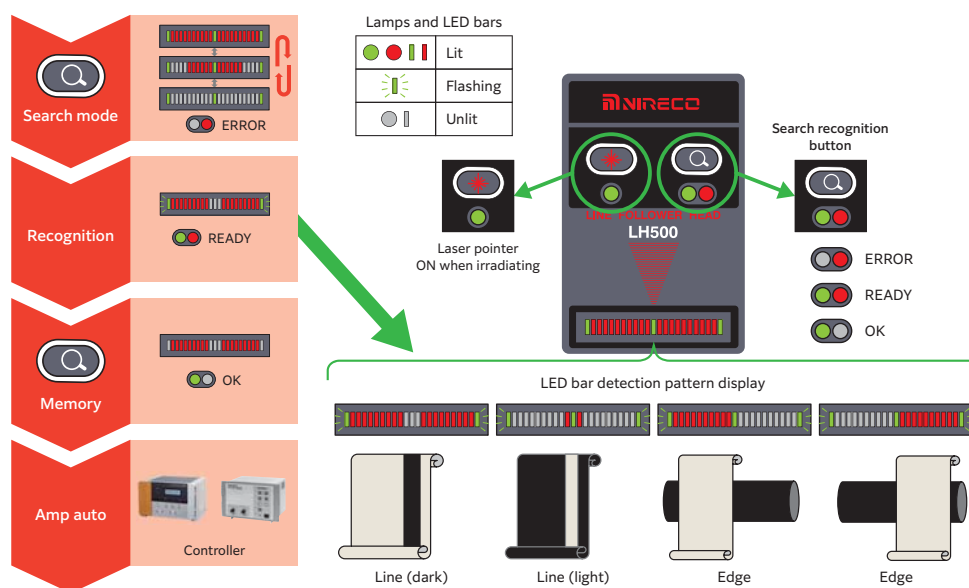
The Line Follower Head LH500 is a sensor that optically detects register lines or patterns printed on a web. In combination with a controller, the LH500 can be used to form an EPC (Edge Position Control) and LFC (Line Follower Control) system.

Line Follower Head LH500 stores detected lines as image information, which it uses to perform pattern matching and comparison operations on image information during operation. With this new system, even if register lines and printing accessories are mixed, the stored lines are always tracked.



- Printed lines stored as image information**
 The new system is highly effective and keeps track of stored line information, even if register lines and printing accessories are mixed.
- Automatic optimization of illuminant color and light volume completed simply by pressing the search button**
 The sensor has an automatic light adjustment function which can be used also for highly reflective material, such as aluminum foil and copper foil.
- Central positioning simple with laser pointer**
 The device is equipped with a laser pointer, improving visibility of control position.
- LED bar makes detection status easy to see**
 The detected object and detection status can be seen at a glance. Use the search button to toggle between operating mode (deviation display) and search mode (pattern display).

LH500 operating procedures



Spotlight distance	With diffuser plate: 1 mm (from web surface to diffuser plate surface) No diffuser plate: 15 mm (from web surface to main unit surface)
Detection range	7 mm (with reference to memory pattern position)
Pattern memory width	3 mm (main unit center)
Light source	Blue and red high luminance LED
Output	1) Position signal (voltage output): 0.7 to 4.3 V DC (High) 0.07 to 0.43 V DC (Low) 2) Actuator lock signal: Open collector output 30 V, 0.1 A or less ON conditions: pattern errors or outside of pattern field of view, in search mode
Detection element	CCD linear image sensor

Pixel resolution	14 μm
Power supply	+15V DC, 250 mA / -15 V DC, 30 mA
Ambient temperature	0 to +50°C
Ambient humidity	35-85% RH (no condensation)
Protective structure rating	IP50
Laser	Class 2 (IEC), ON/OFF switch (for laser pointer)
Body material	AC4C
Outer dimensions	108 (H) × 58 (W) × 50 (D) mm (projected part is not included)
Mass	Main unit: 0.5 kg Screw guider: 0.5 kg
Cables	LH500 cable (optional) Model: MD0002640-70 Conversion cable (optional) Model: MD0002640-80

DPC Design Position Control system

NI SERIES ● NIRECO Intelligent Camera NIC100 ● NIRECO Intelligent Panel NIP100

Corrects for meandering, based on pattern reference!

At-roller-surface detection and off-roller detection

This system can be used in both at-roller-surface detection (that reduces the effects of play in the web on detection) and off-roller detection (that reduces the influence of the type of roller material on detection).

A wide range of light sources and filters



Combinations of the built-in LED lighting unit and the filters enable the system to cope with a range of roller surfaces including chrome-plated rollers and rubber rollers.



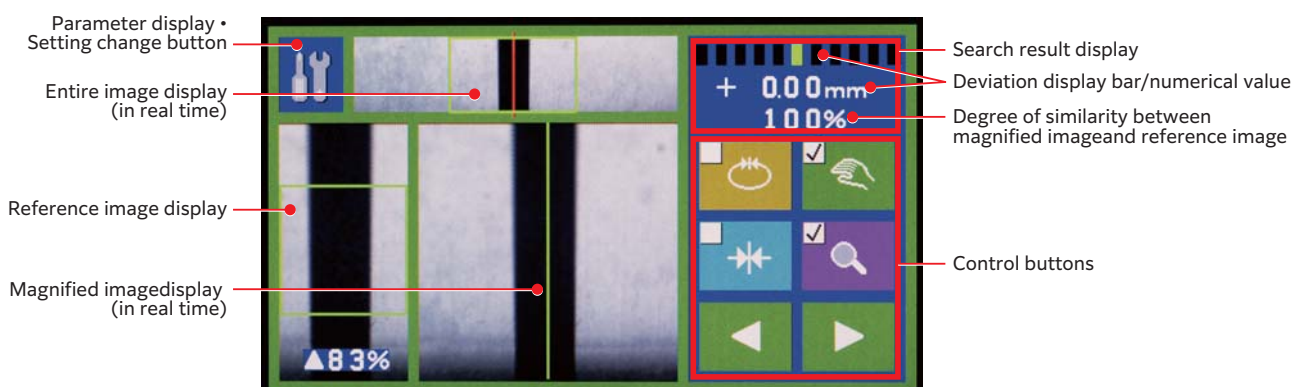
System components when under AE500 control



- **Pattern matching**
The system takes reference positions from within the entire image (such as the line, edge, pattern and text) and stores them in memory, detects web meandering and sends out correction signals.
- **ZNCC (Zero-mean Normalized Cross-Correlation)**
Stable detection is assured, even if there are variations in external light and print density.
- **Easy search function**
Simply specify the reference position from within the entire image and press the Search button to record the reference position in memory and start the detection.

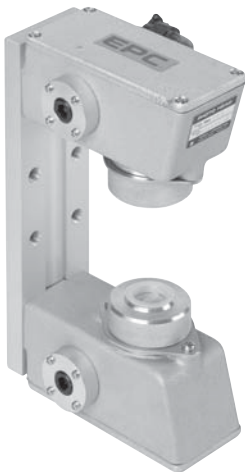
Model	NIP100	NIC100
External appearance		
Power supply	DC 24 V (2 A)	DC 24 V (1 A) Supplied by the NIP100
Range of measurement	—	10 mm (Displayed field of view: 24 mm)
Detection resolution	—	Approx. 5 μ m (Through sub-pixel processing)
Light source	—	High brightness color LED (white)
Imaging element	—	CCD area sensor (VGA W640×H480)
Display function	Color touch-screen panel (4.3 inch)	—
Analog deviation signal output	DC 0 to +5V	—
Lock signal output	Open collector	—
Sensor roller diameter	—	ø80 mm or greater
Ambient temperature	0 to +50°C	
Ambient humidity	35-85% RH (no condensation)	
Protective structure rating	IP50	
Body material	ADC12 / A5052	ADC12 / SPCC
Mass	Body 0.5 kg	Body 0.7 kg

Display and operation



Photohead PH30/PH31 * N: No air purge. P: With air purge

Optically detects the edge of the web. Since the distance between projector and receiver of 75 mm is wide, this system is suitable for large machinery and thick webs.



Photohead PH30

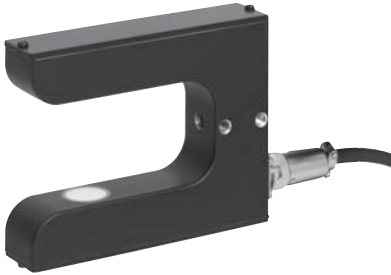


Photohead PH31

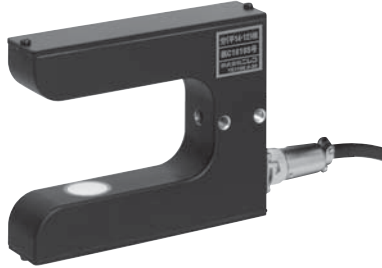
Range of measurement	20 mm																								
Light source	12 V tungsten bulb																								
Sensitivity	Detects positional variations of 0.1 mm in a strip (opaque web).																								
Output voltage	Voltage proportional to variation of light intensity at the silicon light sensor element (mV).																								
Power supply	Adjust the voltage supplied from the amplifier to: PH30: 6 V DC PH31: 12 V DC																								
Compressed air consumption for air purge specification	400 NL/min (at 0.05 MPa)																								
Allowable back pressure	0.05 MPa																								
Paint color	Silver																								
Ambient temperature	-10 to +60°C																								
Body material	Cast aluminum alloy																								
Mass	PH30: 3 kg PH31:																								
	<table><tr><th>Model</th><th>V</th><th>Mass (kg)</th></tr><tr><td>PH31-3</td><td>300</td><td>31</td></tr><tr><td>PH31-4</td><td>400</td><td>33</td></tr><tr><td>PH31-5</td><td>500</td><td>36</td></tr><tr><td>PH31-6</td><td>600</td><td>38</td></tr><tr><td>PH31-7</td><td>700</td><td>40</td></tr><tr><td>PH31-8</td><td>800</td><td>42</td></tr><tr><td>PH31-9</td><td>900</td><td>44</td></tr></table>	Model	V	Mass (kg)	PH31-3	300	31	PH31-4	400	33	PH31-5	500	36	PH31-6	600	38	PH31-7	700	40	PH31-8	800	42	PH31-9	900	44
	Model	V	Mass (kg)																						
	PH31-3	300	31																						
	PH31-4	400	33																						
	PH31-5	500	36																						
	PH31-6	600	38																						
	PH31-7	700	40																						
	PH31-8	800	42																						
	PH31-9	900	44																						

Ultrasonic Sensor UH01

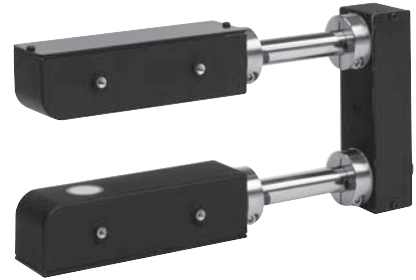
The Ultrasonic Sensors UH01 and UH01A are designed especially to detect transparent film and photosensitive material in an EPC (Edge Position Control) system. They can detect the edge of a web with high accuracy. They are not affected by irregularities in the coating near the edge of transparent film and printed patterns, which affects optical sensors. Combined with Nireco's controller, an electrical EPC system or electrohydraulic EPC system can be constructed. The UH01A is a version of our UH01 ultrasonic sensor with a longer internal length (the distance from the sensor center position to the inner side of the casing). Internal lengths of 200 mm, 300 mm, 400 mm and 500 mm are available. The internal length of the UH01 is 60 mm (fixed).



UH01



Intrinsically safe anti-explosion systems
Ultrasonic Sensor UH01S



Ultrasonic Sensor UH01A, SA

Model	UH01	UH01A	UH01S *4	UH01SA *4
Sensor gap	48 mm			
Effective detection length	8 mm			
Sensitivity	Detects a web displacement of 0.1 mm			
Frequency response	200 Hz			
Sensor output	Hi mode *1 When fully closed 0 V DC, When fully opened +5 V DC Lo mode When fully closed 0 mV DC, When fully opened +300 mV DC Resistance load of at least 2 kΩ		When fully closed 0 V DC, When fully opened +300 mV DC	
Power supply	+15 V DC (100 mA) , -15 V DC (50 mA)		+7 ~ +12 V DC (70 mA)	
Ambient temperature	0 to +50 °C			
Ambient humidity	35 to 85%RH (no condensation)			
Mass: Cable (5 m)	0.36 kg		0.1 kg/m Approx.	
Screw guider *3	0.63 kg *2			

Sensor Head Mass

Model	UH01 UH01S	UH01A-200 UH01SA-200	UH01A-300 UH01SA-300	UH01A-400 UH01SA-400	UH01A-500 UH01SA-500
Internal length	60 mm	200 mm	300 mm	400 mm	500 mm
Mass	0.3 kg Approx. (UH01) 0.4 kg Approx. (UH01S)	1.2 kg Approx.	1.3 kg Approx.	1.4 kg Approx.	1.5 kg Approx.

*1: The factory default setting is Hi mode.

*2: Attachment of UH01A type
Only lengths of up to 200mm can be used with standard screw guiders.
Please consult with our sales office if you plan to use a greater length.

*3: Screw guider not included. Please purchase separately when required.

*4: S: This product meets intrinsically safe explosion-proof requirements.

● Model UH01S, SA intrinsic explosion prevention and safety The UH01S ultrasonic sensor has passed tests as an intrinsic anti-explosion safety device when combined in a system with devices or wiring which meets intrinsic anti-explosion safety requirements.

- Explosion prevention symbol : Ex ia IIA T4
- Mode inspection pass date : 12th December 2002
- Safety device(Zener barrier)model : MTL715P+for power supply
: MTL751ac for signals
- Usable hazardous zone : Type 0, Type 2 locations
- Range of usable hazardous gases and vapors : Gases and vapors group IIA
: Temperature grade T4

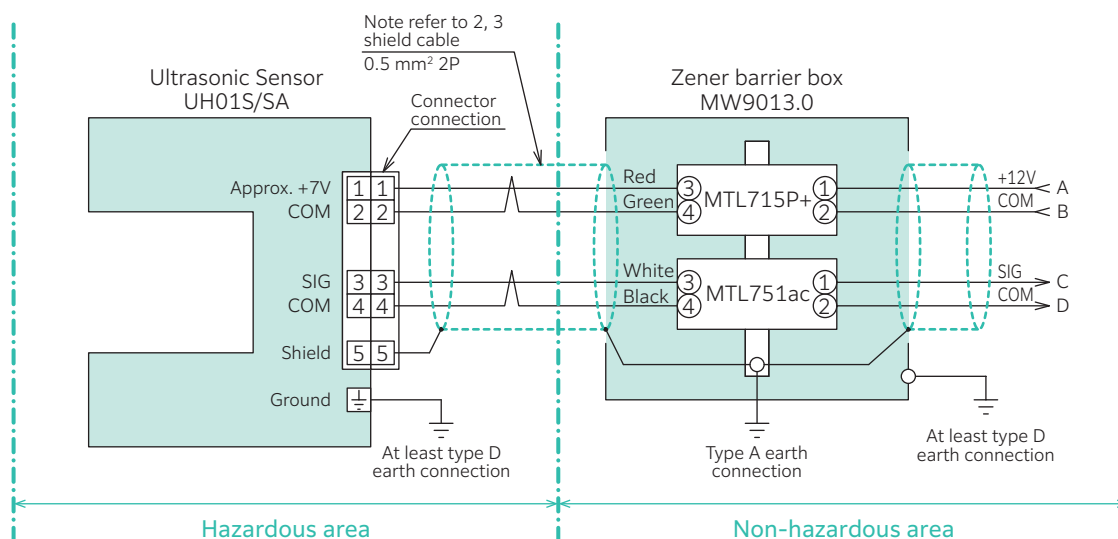
Note) Use a Zener barrier which has a label clearly stating our inspection Pass number.

Intrinsically safe anti-explosion systems

We offer intrinsically safe anti-explosion systems that can be used safely in places where the atmosphere contains explosive gases. The sensors are installed in the hazardous area, and the controller is installed elsewhere (in a safe location) with the two sides separated by a Zener barrier.



Zener barrier box



Notes:

1. Read Instruction manual QJ3749.*-E before beginning wiring work or using the system.
2. Make sure that the capacitance of wiring outside the intrinsic safety circuit does not exceed 0.05 μF , and that its inductance does not exceed 0.5 mH.
3. The twisted pairs should use 1 and 2 as one pair, and 3 and 4 as the other.
4. Refer to the "Recommended practices for explosion-protected electrical installations" or the "Users' guidelines for electrical installations for explosive gas atmospheres in general industry" for further details for wiring work.
5. Intrinsic safety construction Ex ia IIA T4.

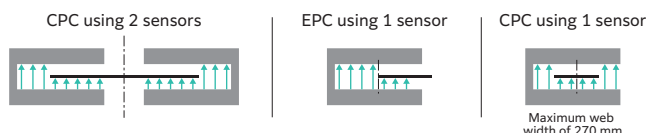
Intrinsic safety Ultrasonic Sensor UH01S / SA field wiring

Autowide Sensor AWE280A

This optical sensor for the detection of the position of (non-transparent) webs has a wide field of view (280 mm) so there is no need to move the sensor to the web end position every time the web width changes. In addition, this high-performance sensor can be used for both EPC and CPC systems.



- Both EPC and CPC can be performed using a single AWE280A. (* With 1 sensor, CPC functions when the web width is no wider than 270 mm.)

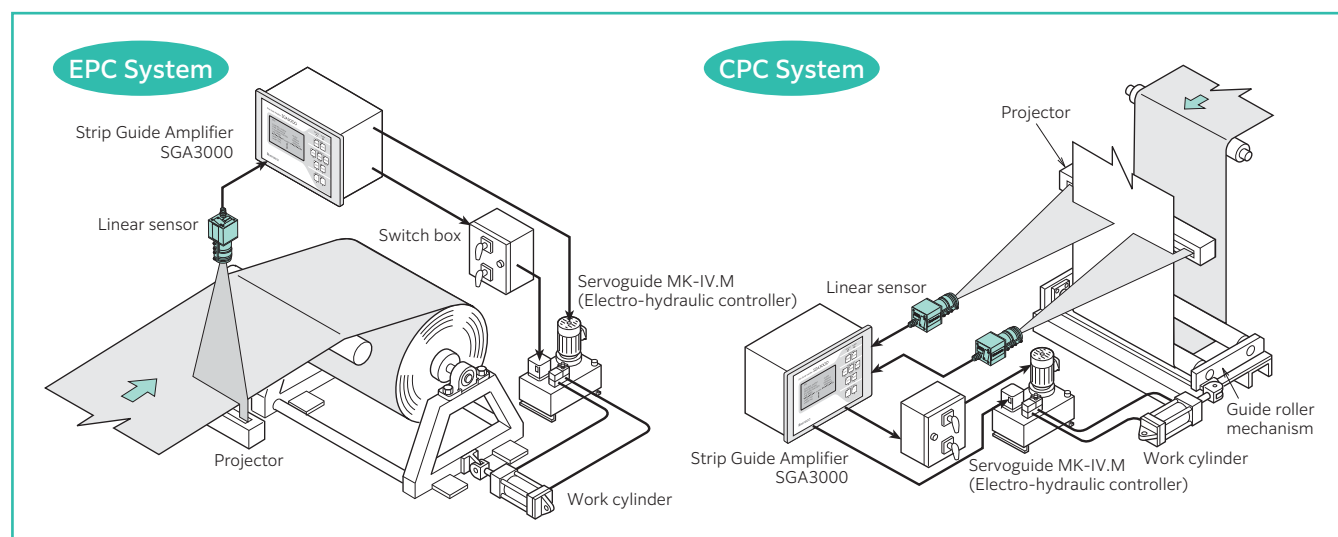


- It can also detect webs made of fabric or other light-transmitting material.
- It can be also used in environments where there is slight amount of dust or occasional drops of water. (Drip-proof finish of IP54 Standard equivalence)
- If the detection sensitivity declines, a warning signal will be output.
- The power-saving design means that the power supply box (PR15X) that was formerly required when two AWE280 sensors were used, is now no longer required.

Supply power voltage	+15V DC (200 mA)
Sensor output signal	When fully closed: DC 0 V. When fully open: DC +5 V (load resistance of at least 2 kΩ)
Sensor gap	50 mm
Range of measurement	280 mm (Mounting face reference 80 mm to 360 mm)
Light source	Red chip LED (peak wavelength of 660 nm) diffuse light source
Sensor element	Contact Image Sensor
Resolution	0.042 mm/pixel
Sensor response time	3 ms
Ambient humidity	0 to +50°C 35 to 85% RH (no condensation)
Body material	Sensor casing: aluminum alloy/cover: SUS304)
Surface treatment	Sensor casing: white anodized aluminum cover: untreated
Mass	3.8 kg
Basic drip - proof construction	Certified to IP54

Linear Sensor LSE4096

The Linear Sensor LSE4096 is a one-dimensional line image sensor that measures the edge, width, position and shape to a high degree of accuracy. The linear sensor detects the web edge and output signals. Thus, CPC or EPC can be digitally processed. The signals are processed by a microprocessor controller. This linear sensor can be used to achieve a high degree of control of webs that the previous model was unable to handle, such as webs of non-woven fabric, gauze, and tire cord. Moreover, the web width and degree of meandering can be measured during control.



CMOS Linear Sensor SLH30

The CMOS linear sensor (model SLH30) is a sensor used in our EPC (Edge Position Control) system. It uses projected LED light and a CMOS line sensor to detect the edge position of the web (the product in sheet form).

The SLH30 is an EPC sensor that has been developed to be able to detect a wider range of materials.

Webs that are difficult to detect (such as tire cord, netting, non-woven fabric, electrical wires) can be detected.

In addition, the 4096-pixel CMOS line sensor gives an excellent linearity and responsiveness.



Sensor gap	50 mm
Range of measurement	26 mm
Light source	Red LED
Light source wavelength	670 nm (visible light)
Detector element	CCD linear sensor
Resolution	7 μ m
Sensor analog output	Voltage 0 to 5 V, DC (max. 20 mA)
Alarm output	Open collector output (max. 35 V 20 mA)
Scan time	1 msec
Power supply	+15 V DC (0.1 A) / -15 V DC (0.01 A)
Ambient humidity	35 to 85% RH (no condensation)
Ambient temperature	0 to +50°C
Body material	Aluminum alloy
Mass	0.65 kg (sensor head) Sensor and screw guider: approx. 1.15 kg)

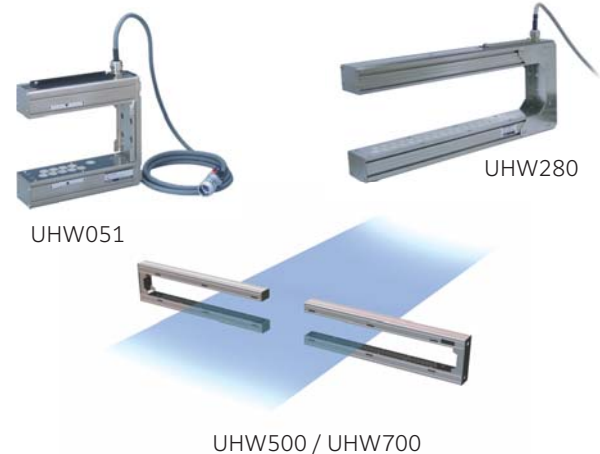
Ultrasonic Autowide Sensor UHW series

Consistently detects changes in the edge position of transparent/thin/reflective webs - over a wide field of view.

Not only is the Ultrasonic Autowide Sensor UHW resistant to changes in ambient temperature and humidity, this sensor for the detection of meandering web edges has outstanding features, including a function that automatically corrects the level of ultrasonic transmission when the thickness of the detected web changes. The Ultrasonic Autowide Sensor UHW is a meandering web edge detector that saves time and labor, and is easy to use.

- Even if the detected material changes, the automatic thickness compensation function enables optimal detection
- In addition to analog detection output, the UHW500 and UHW700 use CirLink, a digital communications network that is unaffected by the width of the detection field of view.

- An automatic correction function which minimizes the influence of changes in ambient temperature and humidity
- Can detect the edges of thin transparent films (3 μ m or greater) over a wide field of view



Models	UHW051	UHW280	UHW500	UHW700
Power supply	DC 15 V (12 to 18 V)			
Power consumption	1.5 W	2.0 W	3.0 W	3.8 W
Detection field of view	56 mm	280 mm	504 mm	728 mm
Resolution	Detects a web displacement of 0.1 mm			
Detection output	0 to 5 V or 4 to 20 mA		0 to 5 V or 4 to 20 mA Digital communications network CircLink (SMSC)	
Linearity	Within ± 0.2 mm			
Ultrasonic emission frequency	223 kHz			
Frequency response	50 Hz			
Thickness and types of detectable webs	Plastic film, paper, metal, etc. that has a thickness of 3 μm or greater (can not detect non-woven fabric)			
Ambient temperature during operation	0 to +50°C			
Ambient humidity during operation	35 to 85% RH (no condensation)			
Mass (2-meter cable from the main unit: 0.5 kg)	1.7 kg	3.5 kg	6 kg	7 kg

High-temperature EPC sensor HE120A (for transparent webs)

The HE120A is a high temperature EPC sensor for use in temperatures of up to 300° C for detecting edges via the transmission method. The sensor head is composed of a light-emitter and a light receiver between which the measuring object passes for measurement. The HE120A outputs an analog signal (0 to 5 V DC), based on the amount of light blocked out by the object being measured.



High-temperature EPC Sensor

Components	1 × light transmission/reception unit (MD0408.0-10P) 2 × heat-resistant fiber optic cable (WM1003.1-12) Zero-span adjustment jig (To use this jig the fiber attachment bracket needs to be the specified shape.)
Detection range	8 mm
Light transmission and reception distance	50 mm ±1 mm
Application (acceptable measuring objects)	Detection of transparent web (paper, sheet steel), film (depending on the material and thickness)
Mass	approx. 2.3 kg (including the fiber attachment bracket)

Light transmission/reception unit

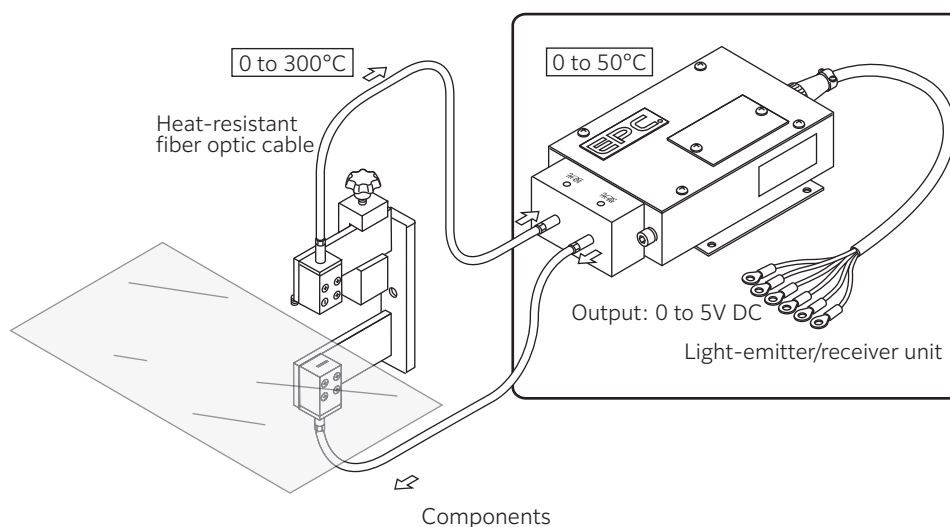
Model	MD0408.0-10P
Operating temperature range	0 to 50°C (no freezing)
Operating humidity range	35 to 85% RH (no condensation)
Mass	Approx. 1.3 kg (including 5 m cable)
Metal materials	SPCC steel, aluminum
Output signal	0 to 5 V DC
Light source	Invisible light LED (870 nm)
Input power	+15 V DC, 130 mA -15 V DC, 60 mA
Structure	IP40 equivalent*

* Structure with the heat-resistant fiber optic cables included.

Heat-resistant fiber optic cable

Model	MW1003.1-12
Operating temperature range	0 to 300°C (no freezing)
Operating humidity range	35 to 85% RH (no condensation)
Mass	Approx. 0.2 kg (one cable)
Metal materials	Stainless steel
Fiber optic material	Multi-component glass
Minimum bend radius	50 mm
Structure	IP30 equivalent

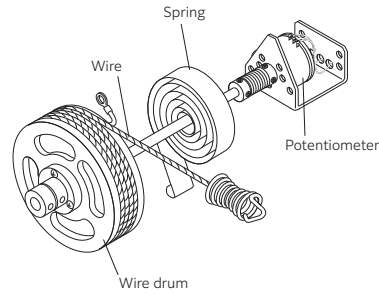
The HE120 high temperature EPC sensor is composed of a light-emitter / receiver unit and a heat-resistant fiber optic cable. The light emitted from the light-emitter (LED lamp) within the light-emitter / receiver unit passes out through the heat-resistant fiber optic cable (for the light-emitter) and in through the heat-resistant fiber optic cable (for the light-receiver), which is located on the side symmetrically opposite the measured object. This light is emitted onto the light-receiver element within the light-emitter / receiver unit, converted into an electronic signal and then output as an analog signal that ranges from 0 V DC (light completely interrupted) to 5 V DC (light completely uninterrupted).



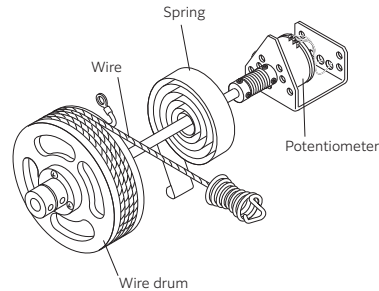
Wire position sensors (analog position transmitters)

These analog position transmitters have a precision potentiometer that converts the linear motion of the object to be measured into an electric resistance proportional to the object's position. A stainless steel wire is wound around a wire drum which incorporates a spring. The shaft of the drum is connected to the shaft of the potentiometer.

Analog position transmitter
FW22



Analog position transmitter
FW80



Structural diagram

● Standard type

FW22.	01 / Y	Maximum detecting length	Potentiometer type
	01	270 mm	Standard potentiometer
	02	840 mm	
	03	1405 mm	
	11	270 mm	Oil-filled potentiometer
	12	840 mm	
	13	1405 mm	
	21	270 mm	Ultra-precision potentiometer
	31	270 mm	High-temperature potentiometer
	32	840 mm	
	33	1405 mm	
	Y	If there are special specifications, values are clearly itemized using signal as Y	

● Flameproof construction

FW31. 01 0 / Y		Maximum detecting length	Potentiometer Type	
01		270mm	Standard Potentiometer	
02		840mm		
03		1405mm		
11		270mm	Oil-contained Potentiometer	
0		Conduit tube thread connection (standard)		External wire lead-in type
1		Pressure-resistant packing (semi-standard)		
	Y	If there are special specifications, values are clearly itemized using signal as Y		

● Standard type

Standard type		Maximum detecting length	Potentiometer Type
FW80. 01 / Y			
01	Y	970mm	Standard Potentiometer
02		3000mm	
03		5000mm	
11	Y	970mm	Oil-contained Potentiometer
If there are special specifications, values are clearly itemized using signal as Y			

	FW22	FW31	FW80
Output	0 to 2000 Ω		
Response speed	400 mm/sec		
Wire tension	7 N (ave.)		4.5 kg MAX.
Ambient temperature	-20 to +60°C (standard) -20 to +80°C (FW22 high-temp. specs only)	-10 to +40°C	-20 to +80°C
Painted color	JIS7.5BG4/1.5		
Installation Location	Indoors only	Flameproof Type Explosion-protection type : Flameproof : d2G4 Certification No. : 22828	
Mass	2 kg	4.4 kg	8.6 kg

Model	length (mm)	Linearity (%)	Hysteresis (%)	Resolution (%)	Permissible power (W) (at 60°C)
FW22	270	±0.5 (Note)	0.2	±0.091	3.3
	840			±0.052	2
	1405			±0.031	2.5
FW31	270	±0.5	0.2	±0.091	3.3
	840			±0.052	2
	1405			±0.031	2.5
FW80	270	±0.5	—	Infinitesimal	1.5
	970			±0.091	3.3
	3000			±0.052	0.8
	5000			±0.030	1.5

Note: Linearity of ultra-precision class is ±0.2%

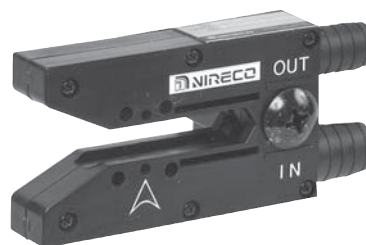
SN12G/SN15 sensing nozzle for the MK-IV.D

Pneumatic-hydraulic model

The sensing nozzle pneumatically and continuously detects the displacement of a web edge without contacting the web. The air pressure for detection is sent to the diaphragm detecting element of the hydraulic controller or the pneumoelectric transducer. The sensing nozzle (SN12) is designed for light industries such as paper, film and textiles. Low-pressure air is blown onto the web edge, therefore, blowing problems may be expected if web material is gauze or if the web tension is weak. In such a case, a guide bar is used to maintain a constant path line for the web. This sensing nozzle delivers the same performance as the SN15, in a smaller and more lightweight package. Use it in confined areas where an SN15 won't fit.



Sensing nozzle SN12G



Sensing nozzle SN15

Model	SN12G
Sensor gap	30 mm
Detecting length	10 mm
Air consumption (supply pressure)	4 kPa
Response Speed	30 msec
Resolution	Detects a web displacement of 0.1 mm
Air consumption (supply pressure)	Max. 45 L/min (4 kPa)
Ambient temperature	-20 to +60°C
Ambient humidity	35 to 85%RH (no condensation)
Protective structure rating	IP50
Material of Body	Die-cast Aluminum alloy
Mass	1 kg (Head), 0.38 kg (Screw guider)

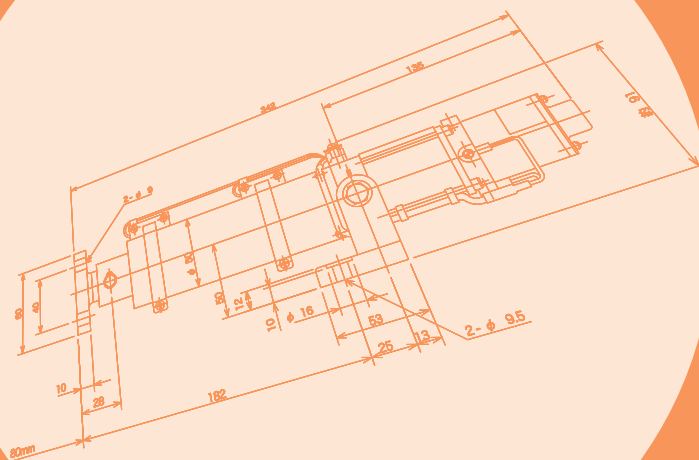
Model	SN15
Sensor gap	10 mm
Detecting length	10 mm
Air consumption (supply pressure)	4 kPa
Response Speed	30 msec
Resolution	Detects a web displacement of 0.1 mm
Air consumption (supply pressure)	Max. 45 L/min (4 kPa)
Ambient temperature	-20 to +60°C
Ambient humidity	35 to 85%RH (no condensation)
Protective structure rating	IP50
Material of Body	Conductive plastic
Mass	0.4 kg(Head), 0.5 kg (Screw guider)

Screw guider

This is a die-cast aluminum alloy attachment bracket for Nireco EPC and LFC sensors. Strongly-made, they can be used for angle adjustment and fine tuning of sensing position.



Wiring diagrams & dimensions



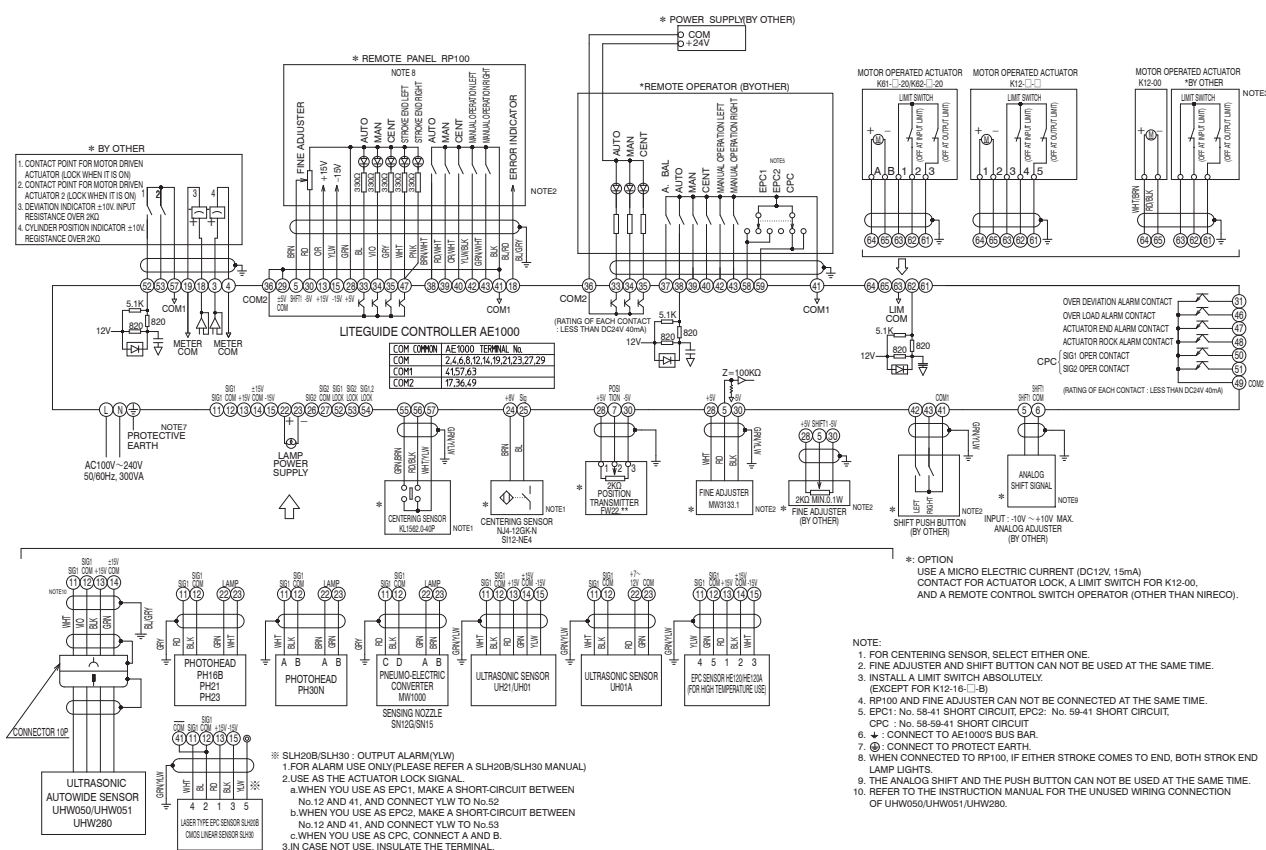
Notice

The wiring diagrams and external dimensions shown in this catalog have been processed to make them easier to see. Please be aware that you should only use these diagrams and dimensions as references when you install the equipment and machinery.

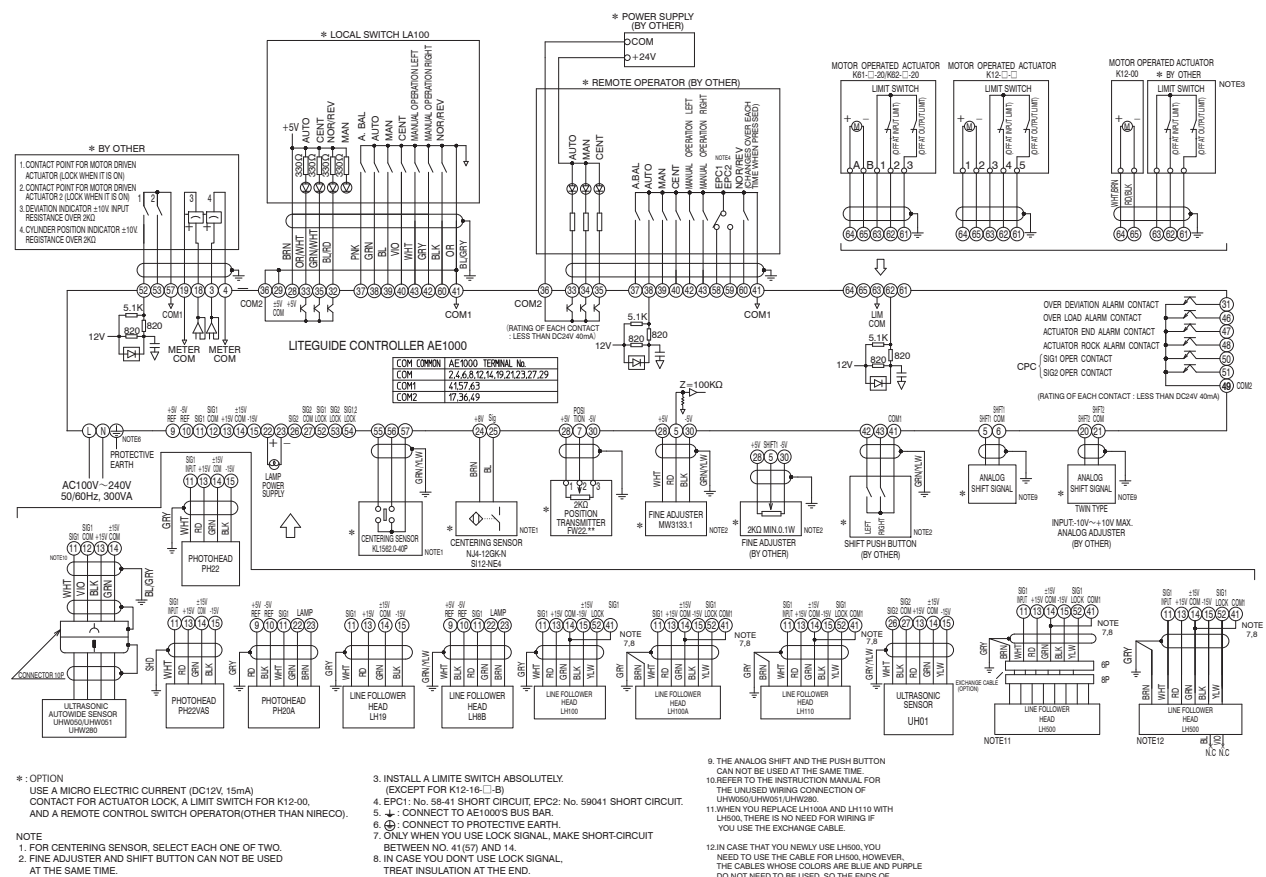
Wiring diagrams

WARNING

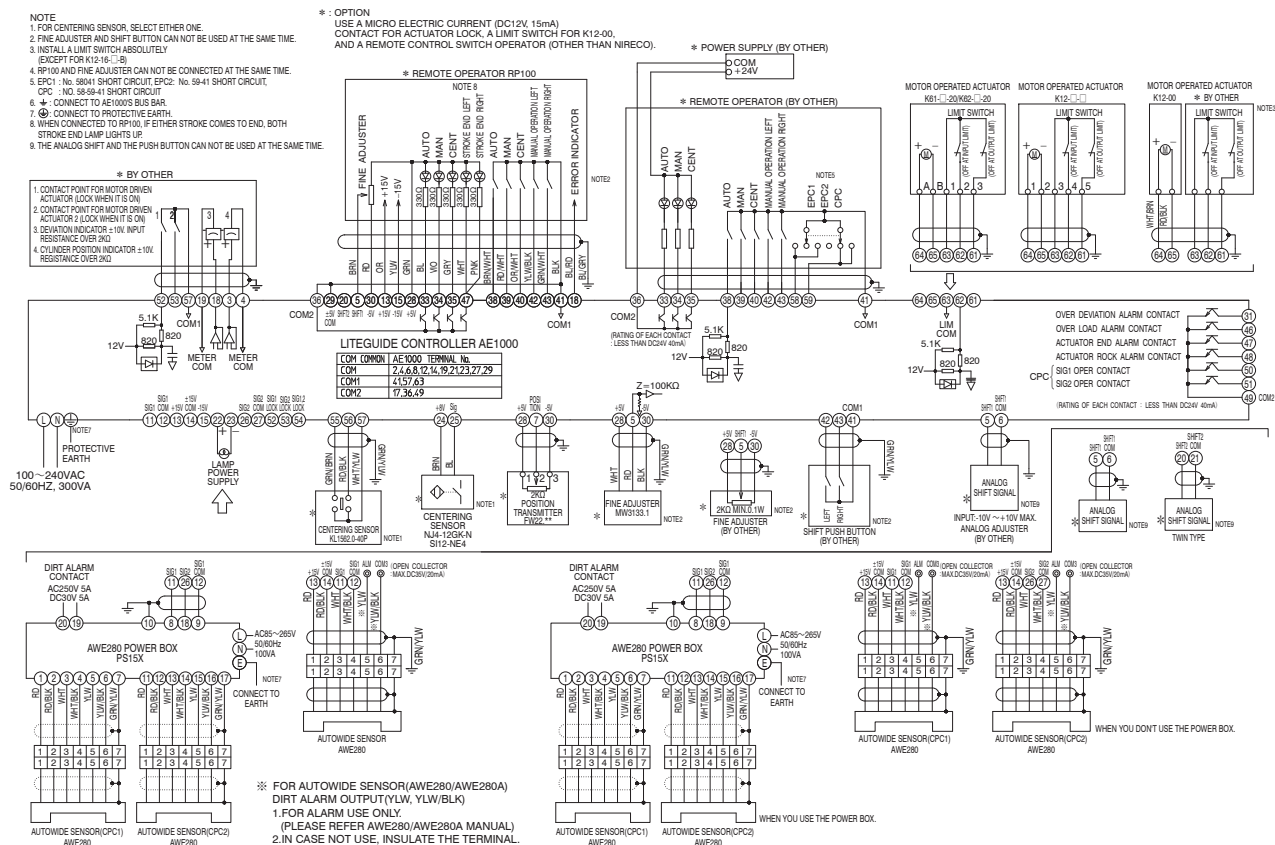
The wiring diagrams shown here should only be used as references when you install the equipment and machinery. When about to perform wiring, please refer to the wiring system diagram or the latest instruction manual.



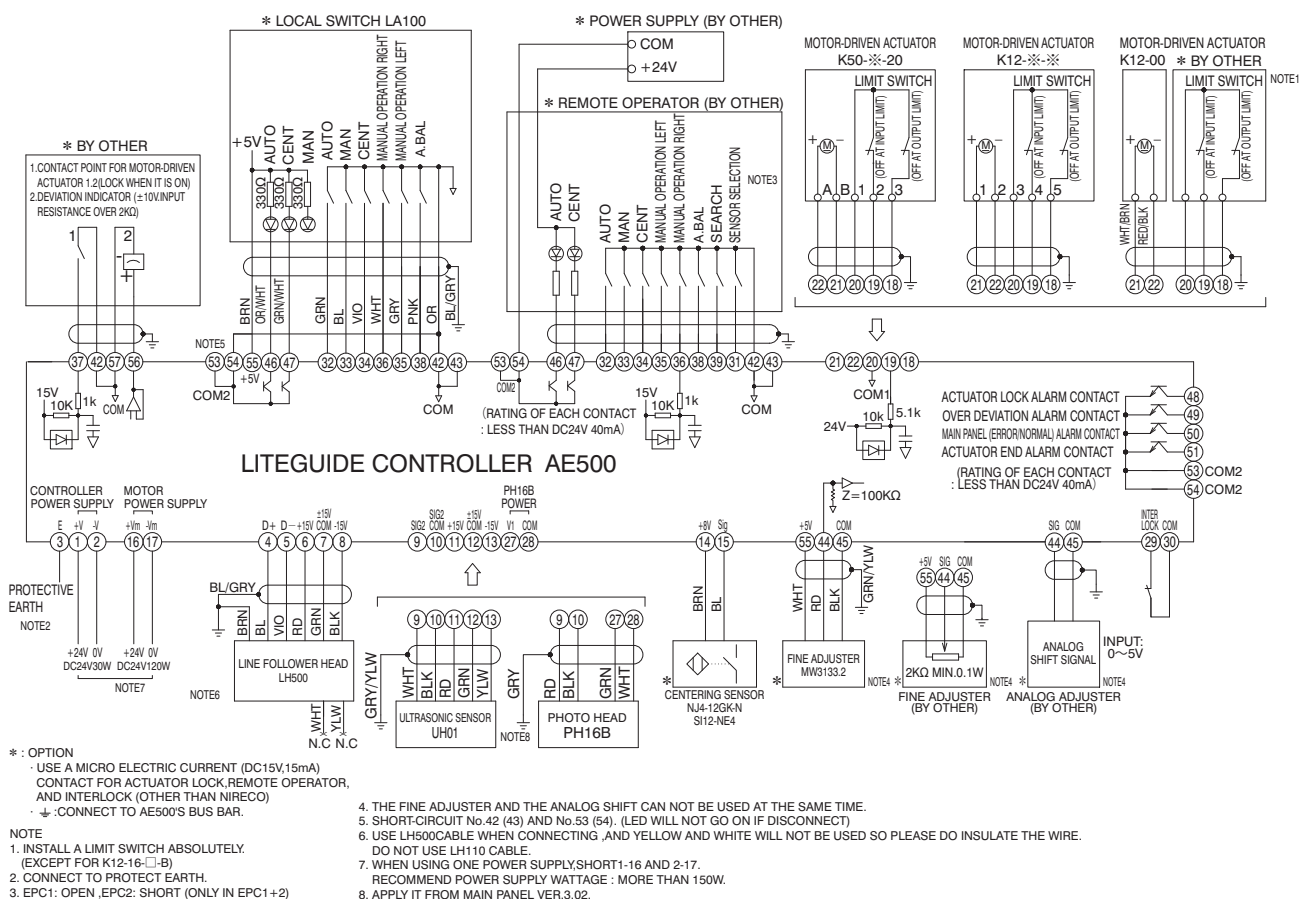
Liteguide Controller Model AE1000 (for EPC) Dwg. no. MK000030-EC0



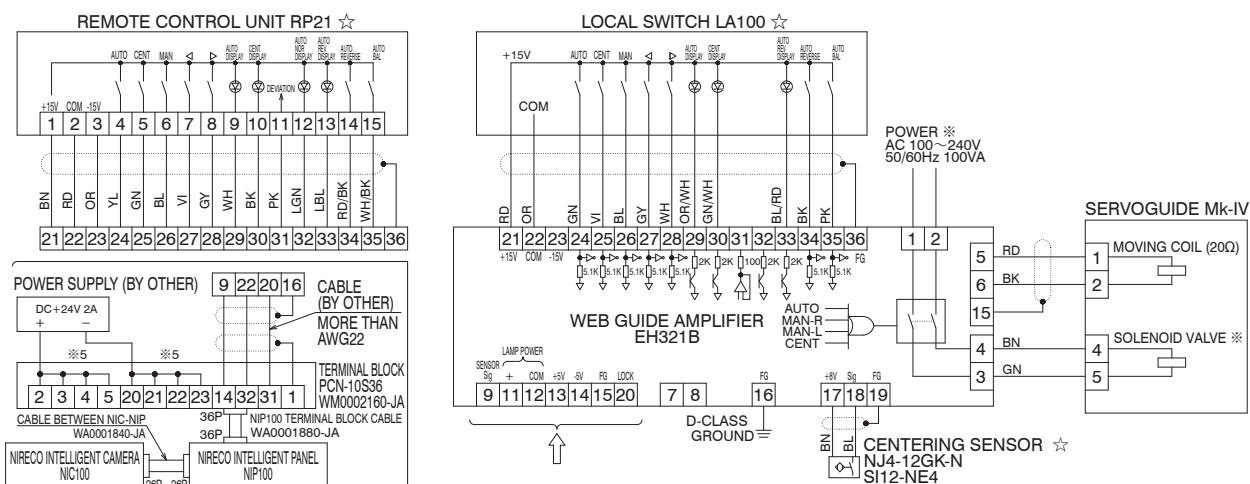
Liteguide Controller Model AE1000 (for LFC) Dwg. no. MK000030-EC1



Liteguide Controller Model AE1000 (for CPC) Drawing No. MK0000030-EC4



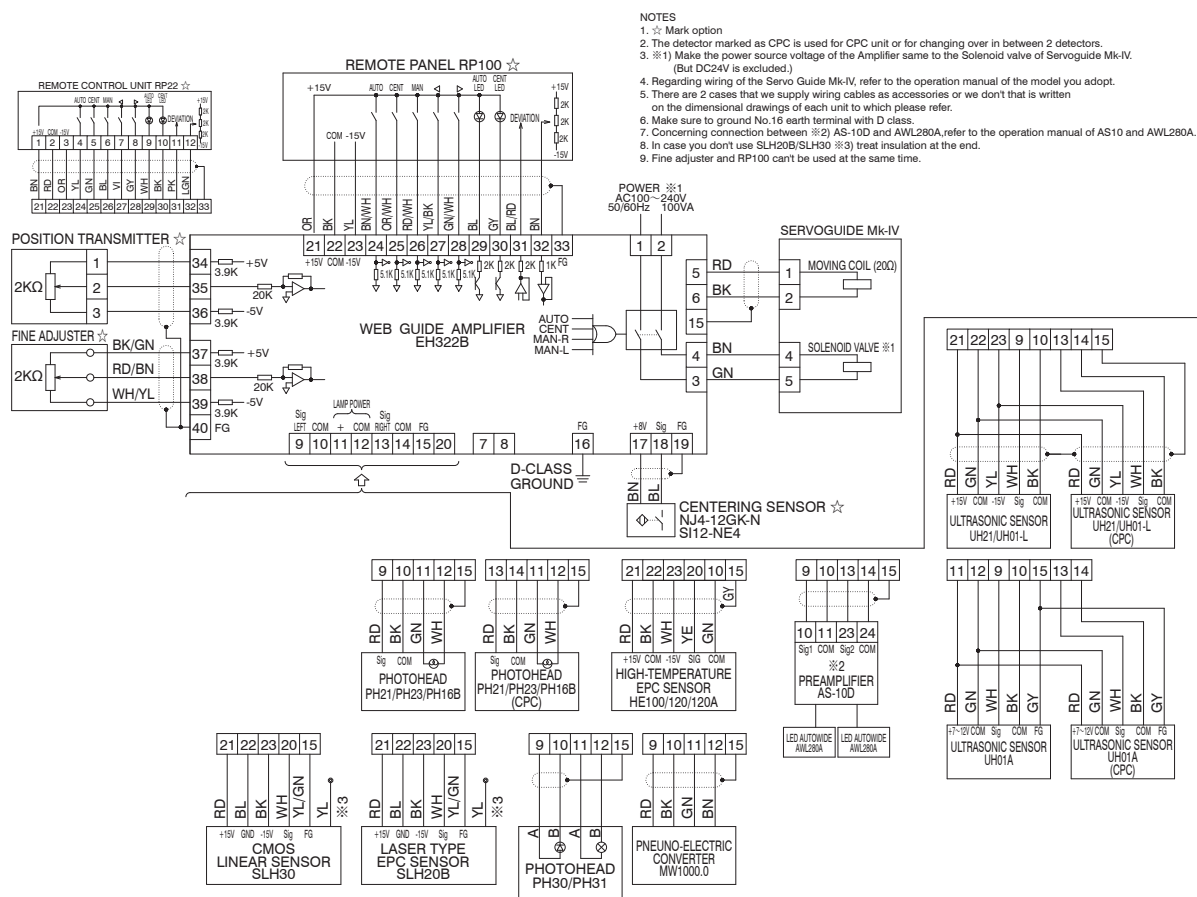
Liteguide Controller Model AE500 Wiring diagrams Drawing No. MK0001030-EC



NOTES

- ☆ Mark option
- ※ Make the power source voltage of the Amplifier same to the Solenoid valve of Servo Guide Mk-IV. (But DC24V is excluded.)
- Regarding wiring of the Servoguide Mk-IV, refer to the operation manual of the model you adopt.
- There are 2 cases that we supply wiring cables as accessories or we don't that is written on the dimensional drawings of each unit to which please refer.
- Make sure to ground No.16 earth terminal with D class.
- Only when you utilize the actuator lock function of LH100A, wire in accordance with the item ※2.
- If not utilize, make isolation treatment without fail.
- Only when you utilize the actuator lock function of LH110, wire in accordance with the item ※3.
- If not utilize, make isolation treatment without fail.
- Only when you utilize the actuator lock function of LH500, wire in accordance with the item ※4.
- If not utilize, make isolation treatment without fail.
- When you replace LH100A and LH110 with LH500, there is no need for wiring if you use the exchange cable.
- In case that you newly use LH500, you need to use the cable for LH500, however, the cables whose colors are blue and purple do not need to be used, so the ends of them should be insulated.
- ※5 SHORTCIRCUIT (+2,3,4,5), (-20,21,22,23).

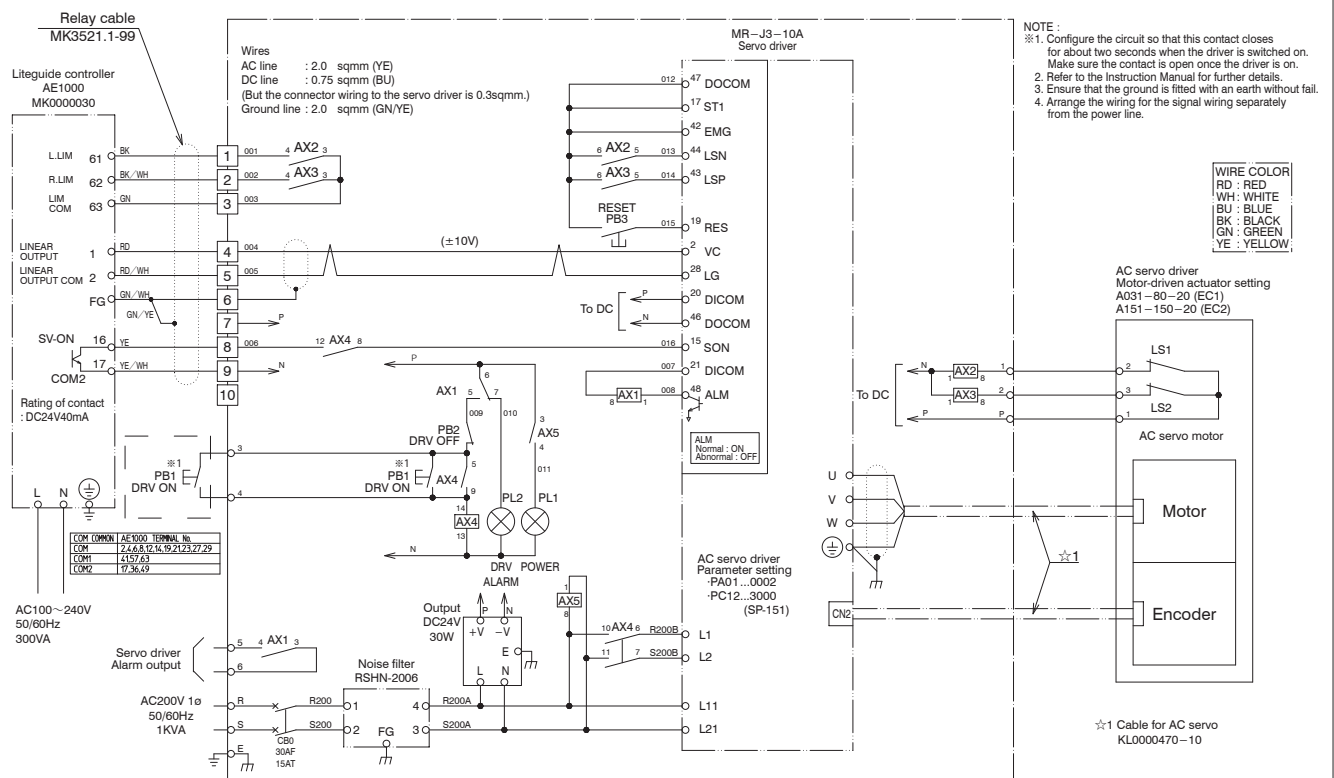
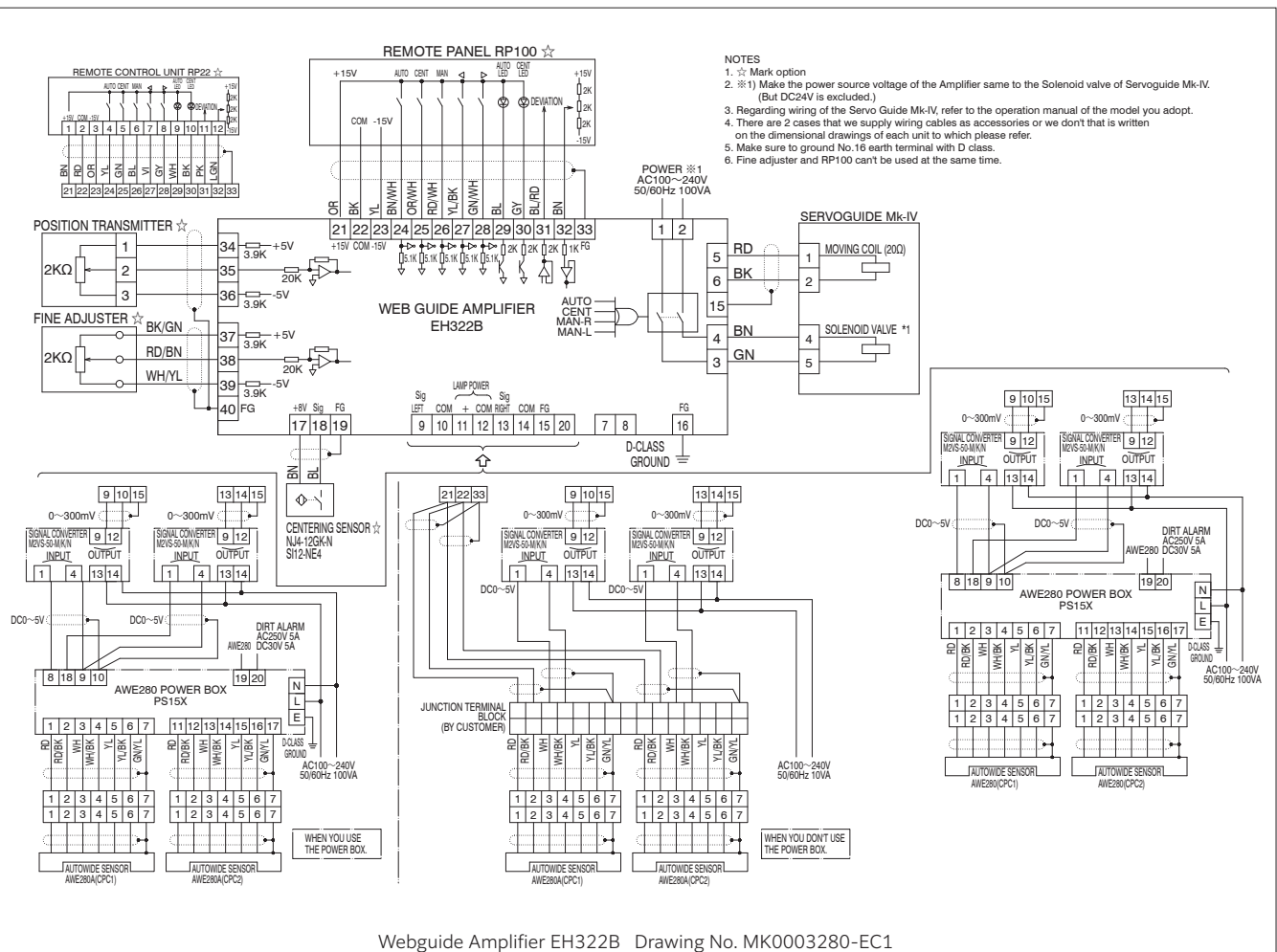
Webguide Amplifier EH321B Drawing No. MK0003270-EC

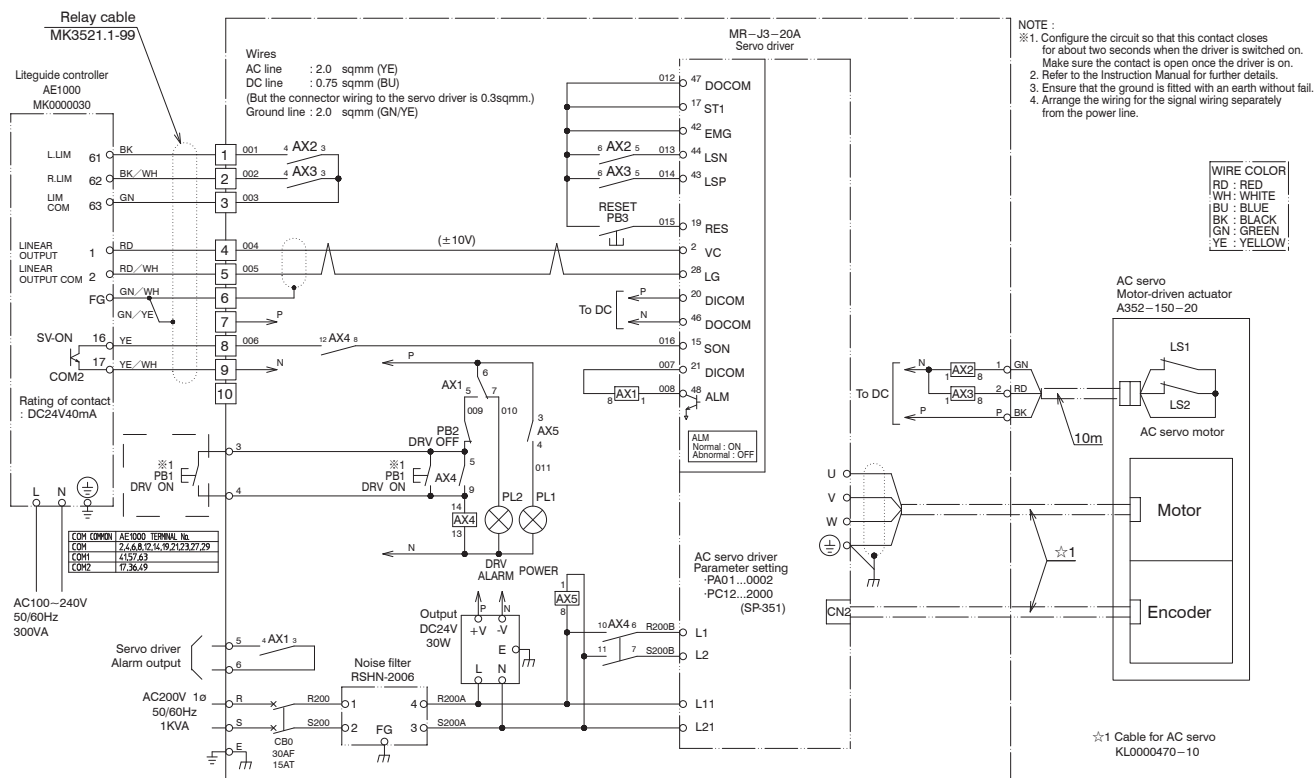


NOTES

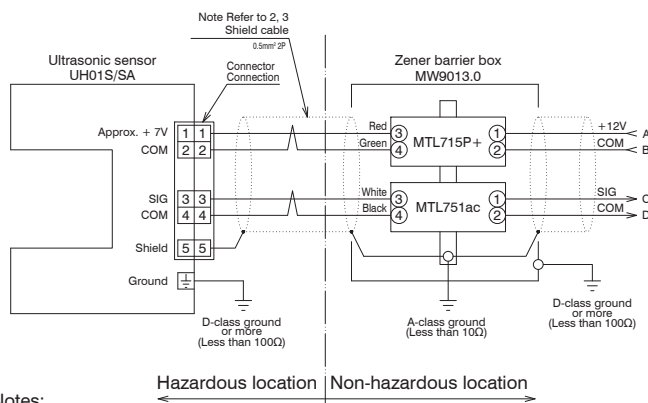
- ☆ Mark option
- The detector marked as CPC is used for CPC unit or for changing over in between 2 detectors.
- ※1 Make the power source voltage of the Amplifier same to the Solenoid valve of Servoguide Mk-IV. (But DC24V is excluded.)
- Regarding wiring of the Servo Guide Mk-IV, refer to the operation manual of the model you adopt.
- There are 2 cases that we supply wiring cables as accessories or we don't that is written on the dimensional drawings of each unit to which please refer.
- Make sure to ground No.16 earth terminal with D class.
- Concerning connection between ※2) AS-10D and AWL280A, refer to the operation manual of AS10 and AWL280A.
- In case you don't use SLH20B/SLH30 ※3) treat insulation at the end.
- Fine adjuster and RP100 can't be used at the same time.

Webguide Amplifier EH322B Drawing No. MK0003280-EC





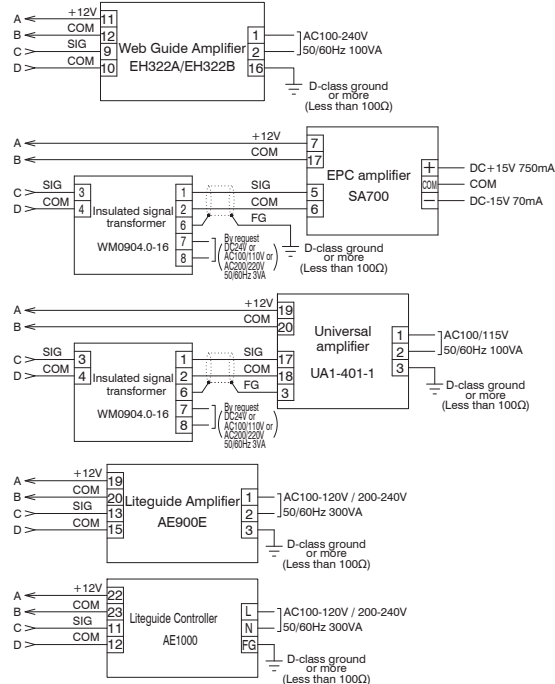
Wiring diagrams between sensor amplifiers (typical examples)



Notes:

1. Read Instruction Manual QJ3749.*E before beginning wiring work or using the system
2. Make sure that the capacitance of wiring outside the intrinsic safety circuit does not exceed 0.05μF, and that its inductance does not exceed 0.5mH.
3. The twisted pairs should use 1 and 2 as one pair and 3 and 4 as the other.
4. Refer to "User's Guidelines for Electrical Installations for Explosive Gas Atmospheres in General Industry" when carrying out wiring work.
5. Intrinsic safety construction Ex ia IIA T4.
6. Connect A to E together when connecting to this amplifier.
7. If a Web Guide Amplifier (EH322A/EH322B) is used, adjust power supply to the ultrasonic sensor to +12V before connecting.
8. If an EPC amplifier (SA700) is used, adjust power supply to the ultrasonic sensor to +12V before connecting.
9. If an Universal amplifier (UA1-401-1) is used, adjust power supply to the ultrasonic sensor to +12V before connecting.
10. If a Liteguide Amplifier (AE900E/AE1000) is used, adjust power supply to the ultrasonic sensor to +12V before connecting.

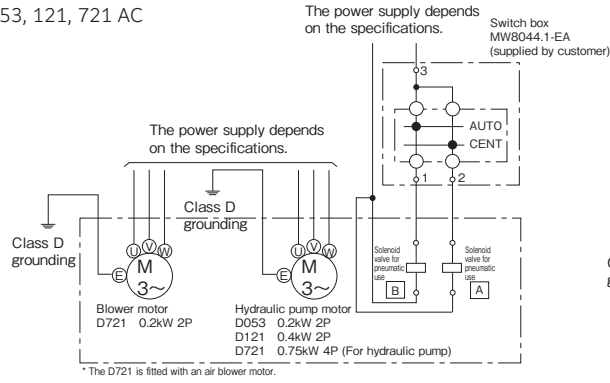
※ FG indicates frame grounding



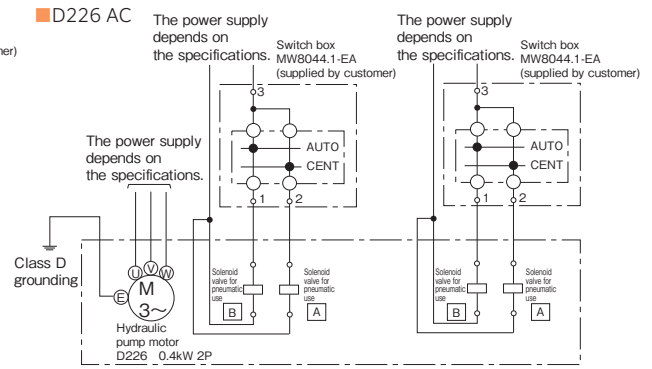
Intrinsically safe anti-explosion systems

Ultrasonic Sensor UH01S/SA Field Wiring Drawing No. QM1216.0-EC

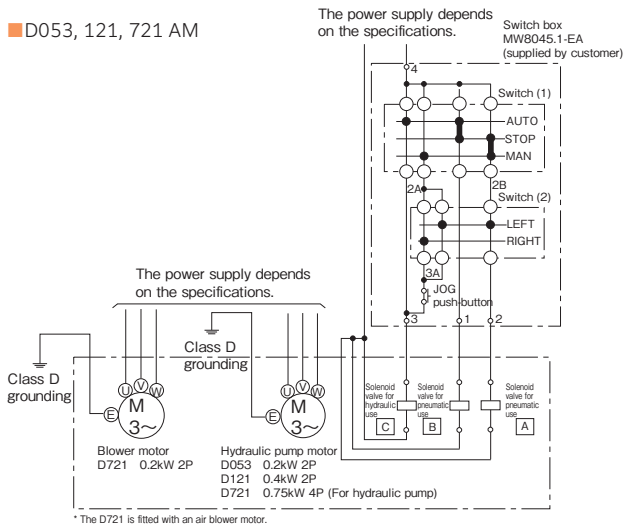
■ D053, 121, 721 AC



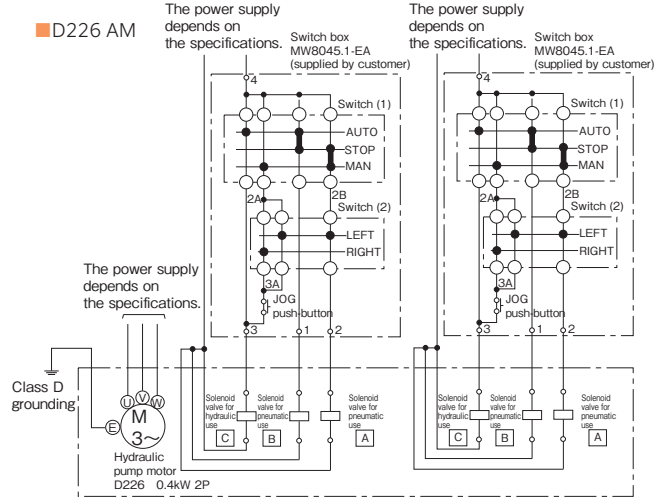
■ D226 AC



■ D053, 121, 721 AM

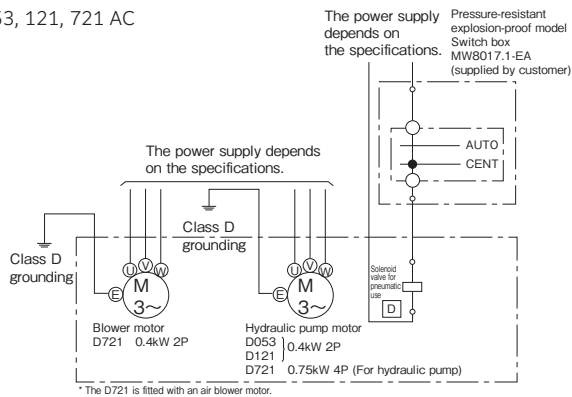


■ D226 AM

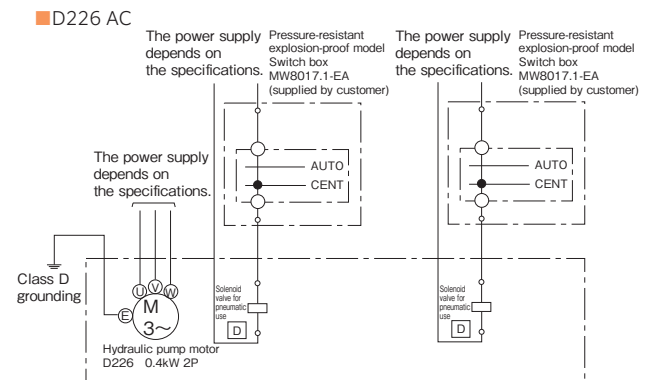


Servoguide D models (standard)

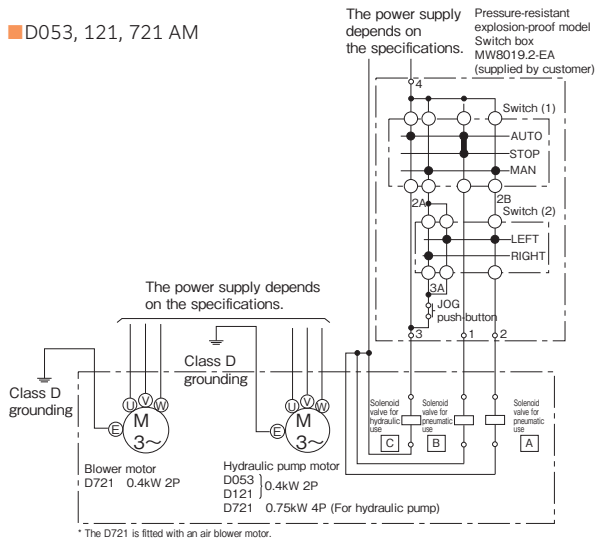
■ D053, 121, 721 AC



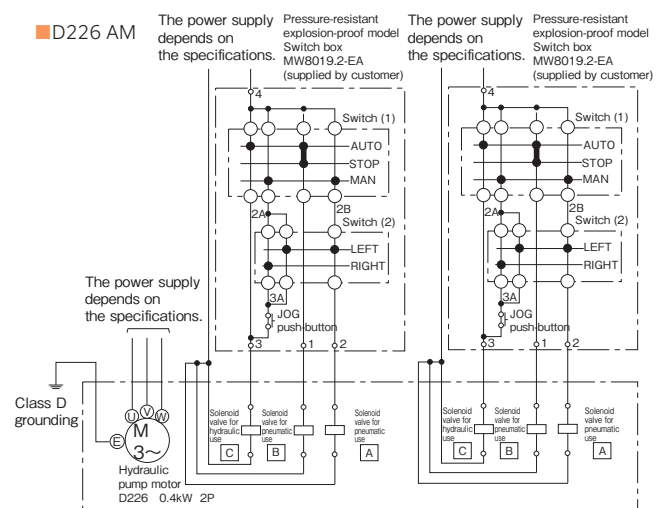
■ D226 AC



■ D053, 121, 721 AM



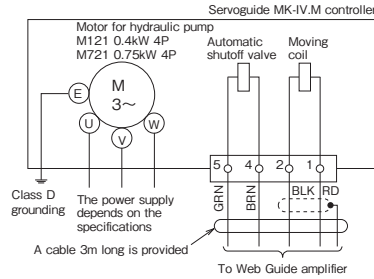
■ D226 AM



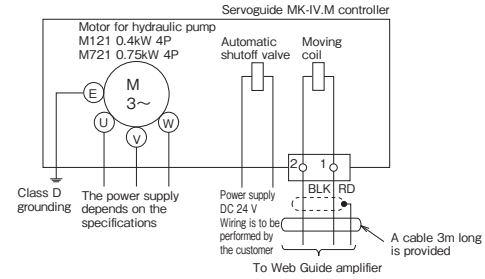
Servoguide D models (explosion proof)

■ M121/M721-□-□-*

(Solenoid valve specifications when AC 100 V to AC 240 V)

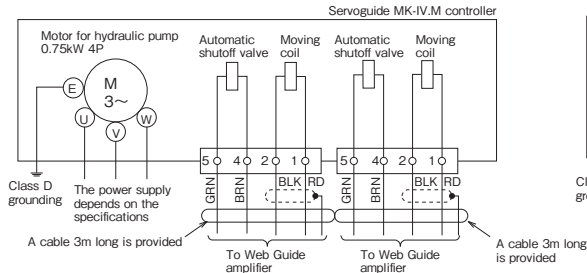


■ M121/M721-□-□-4

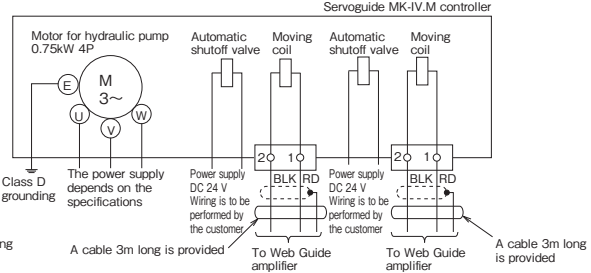


■ M220-□-□-*

(Solenoid valve specifications when AC 100 V to AC 240 V)



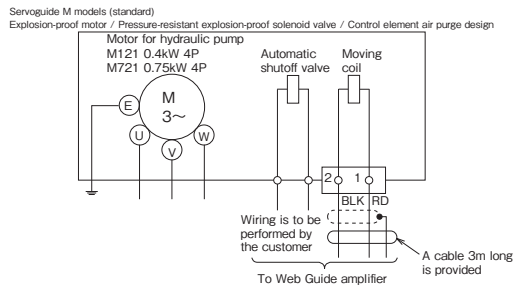
■ M220-□-□-4



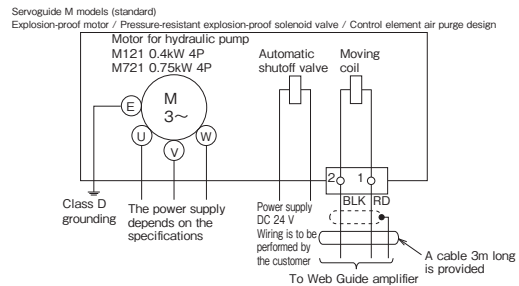
Servoguide M models (standard)

■ M121/M721-□-□-*

(Solenoid valve specifications when AC 100 V to AC 240 V)

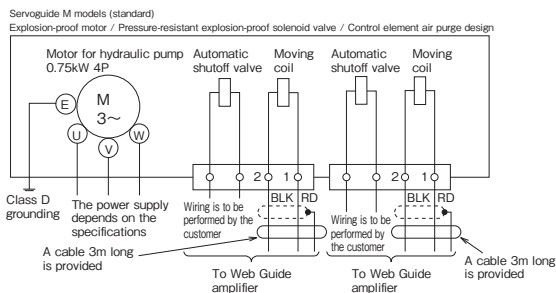


■ M121/M721-□-□-4

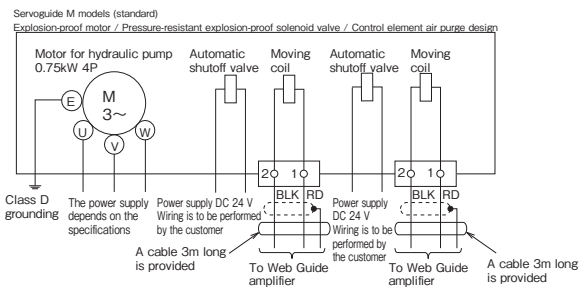


■ M220-□-□-*

(Solenoid valve specifications when AC 100 V to AC 240 V)



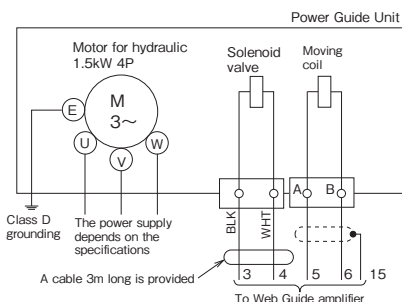
■ M220-□-□-4



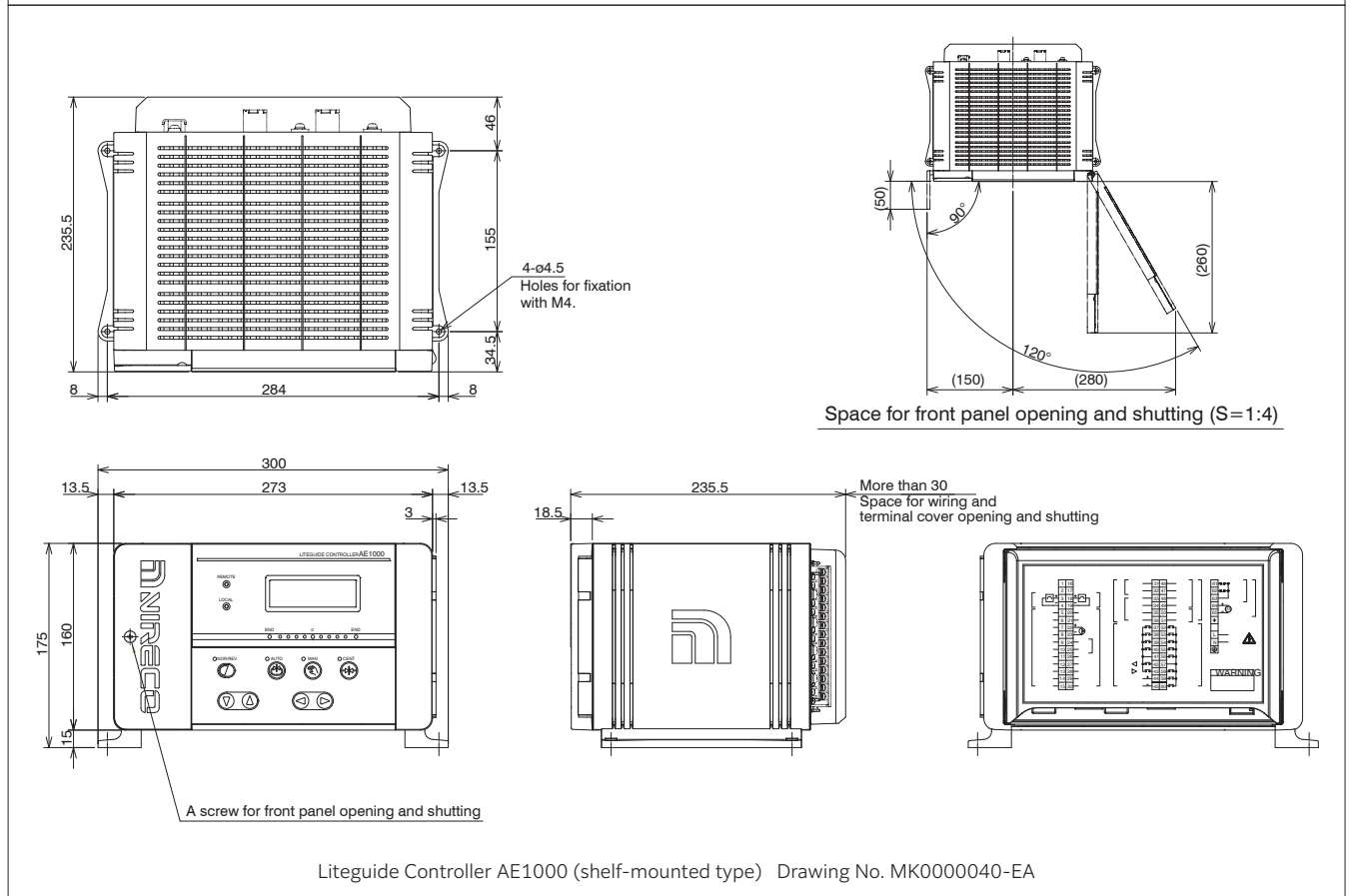
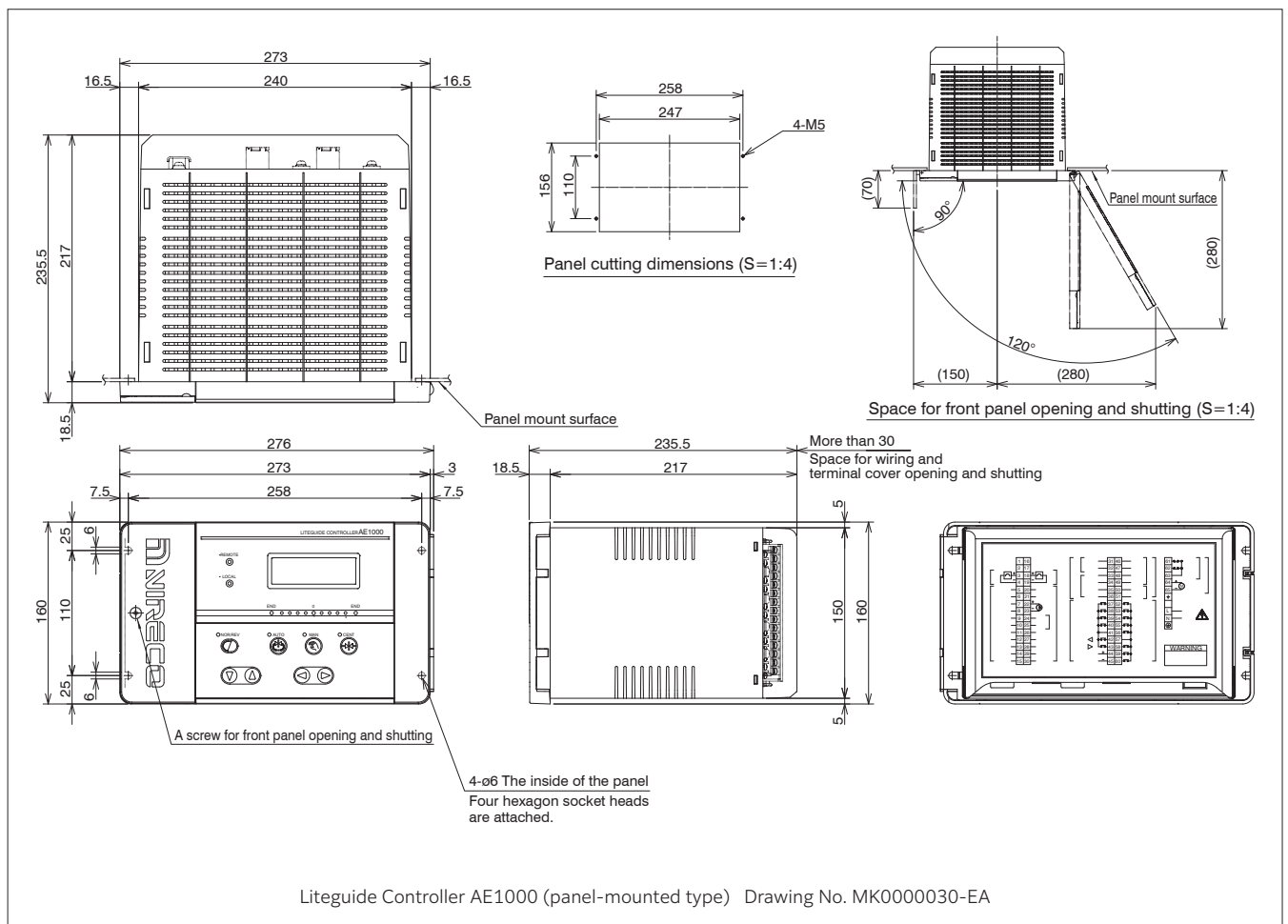
Servoguide M models (Explosion-proof motor / Pressure-resistant explosion-proof solenoid valve / Control element air purge design)

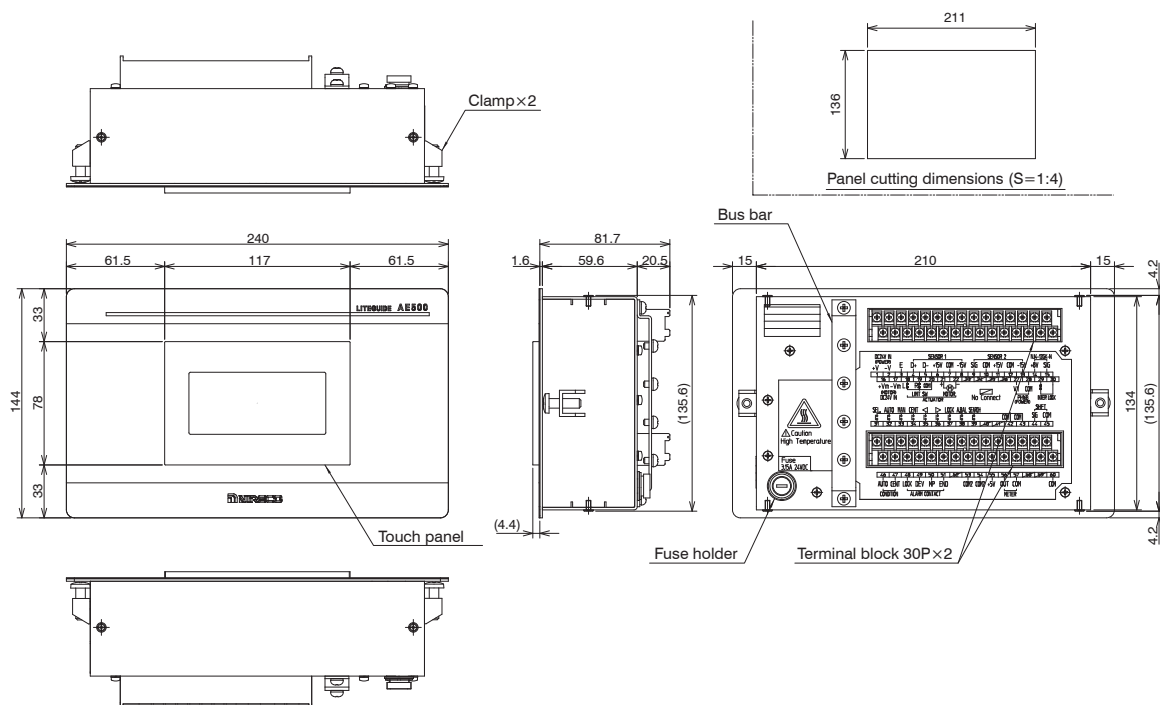
Power Guide Unit
(High-output/High-response controller)

■ M820-AM

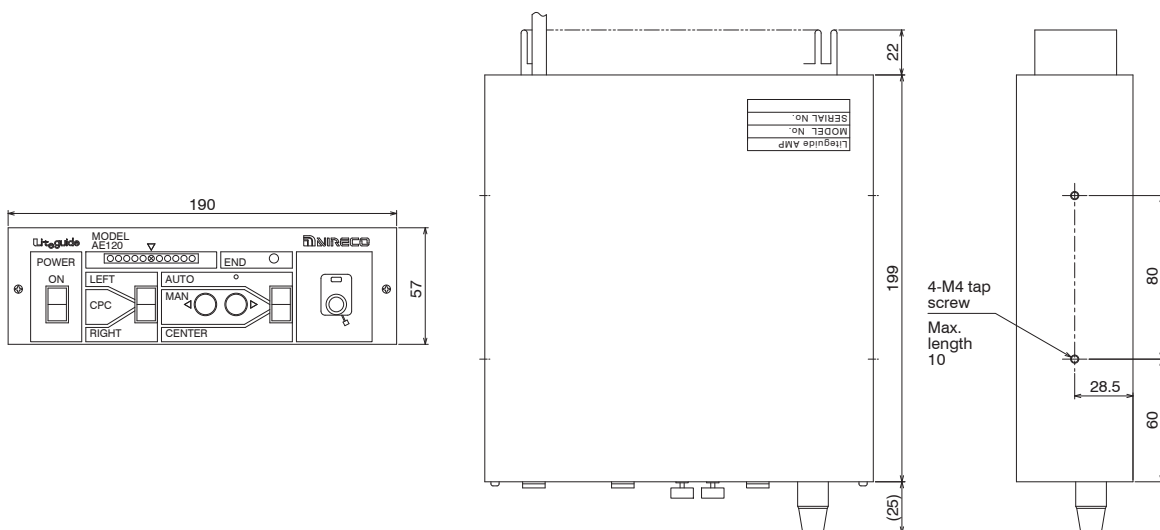


Dimensions

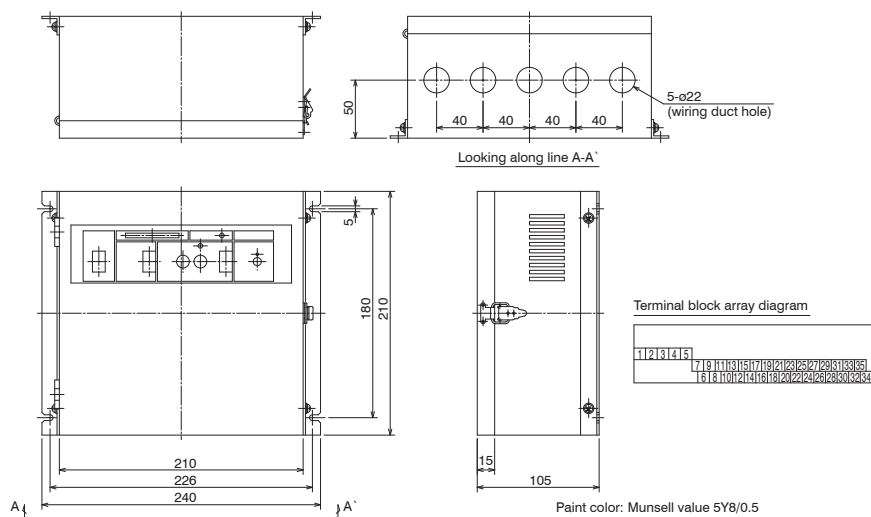




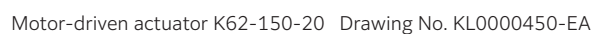
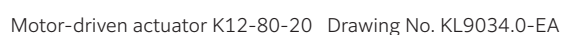
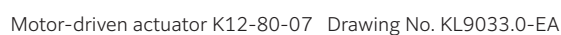
Liteguide Controller AE500 Drawing No. MK0001030-EA

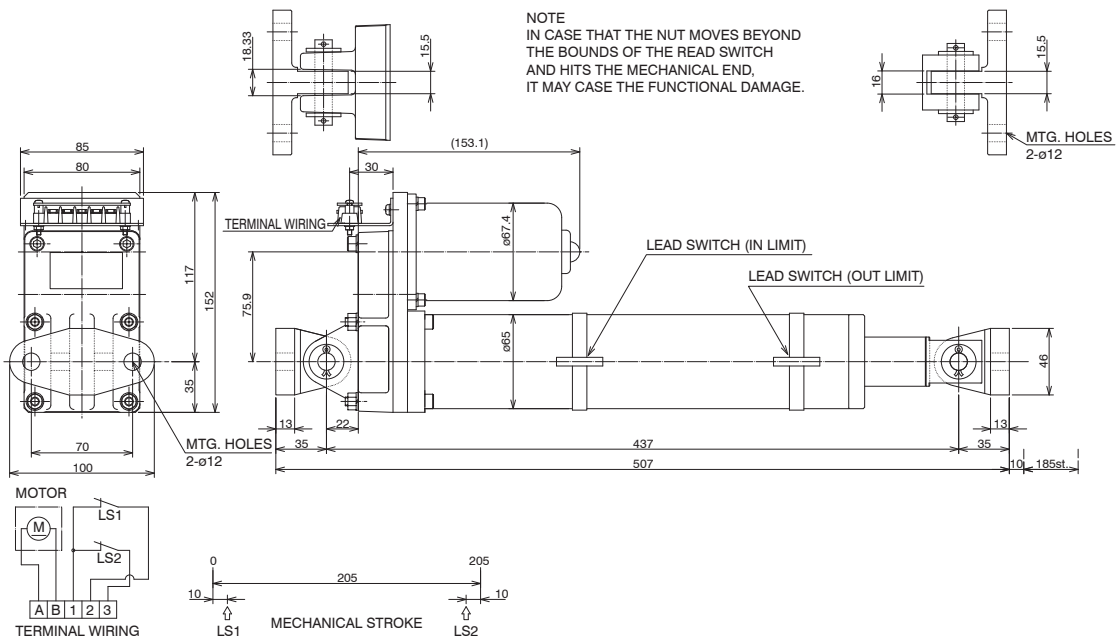


Liteguide Controller AE120 Drawing No. MK3035.0-EA

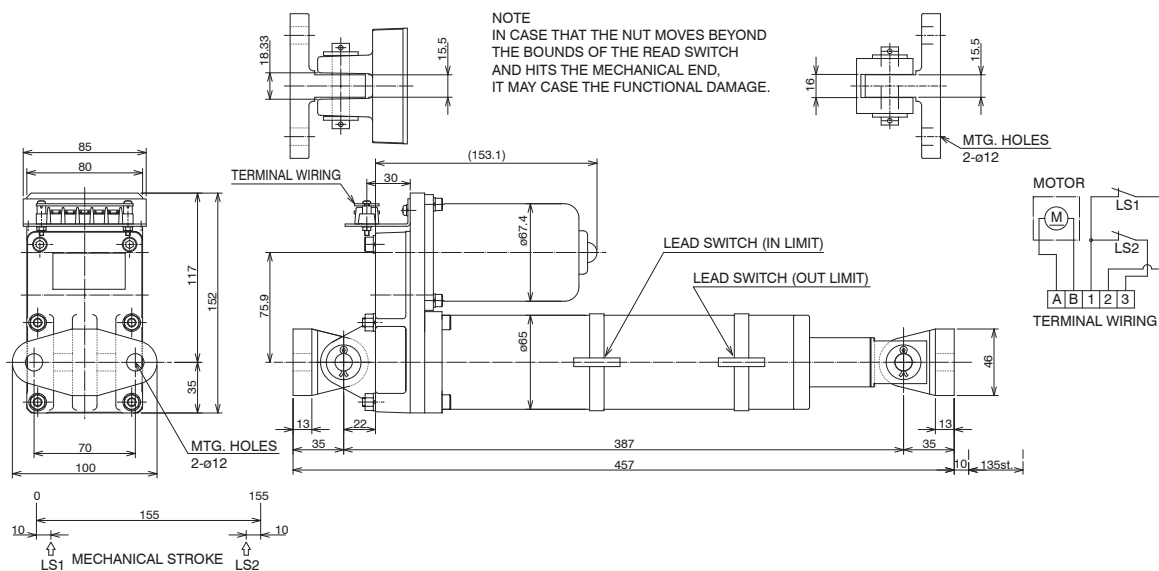


Liteguide Controller AE122 Drawing No. MK3443.0-EA

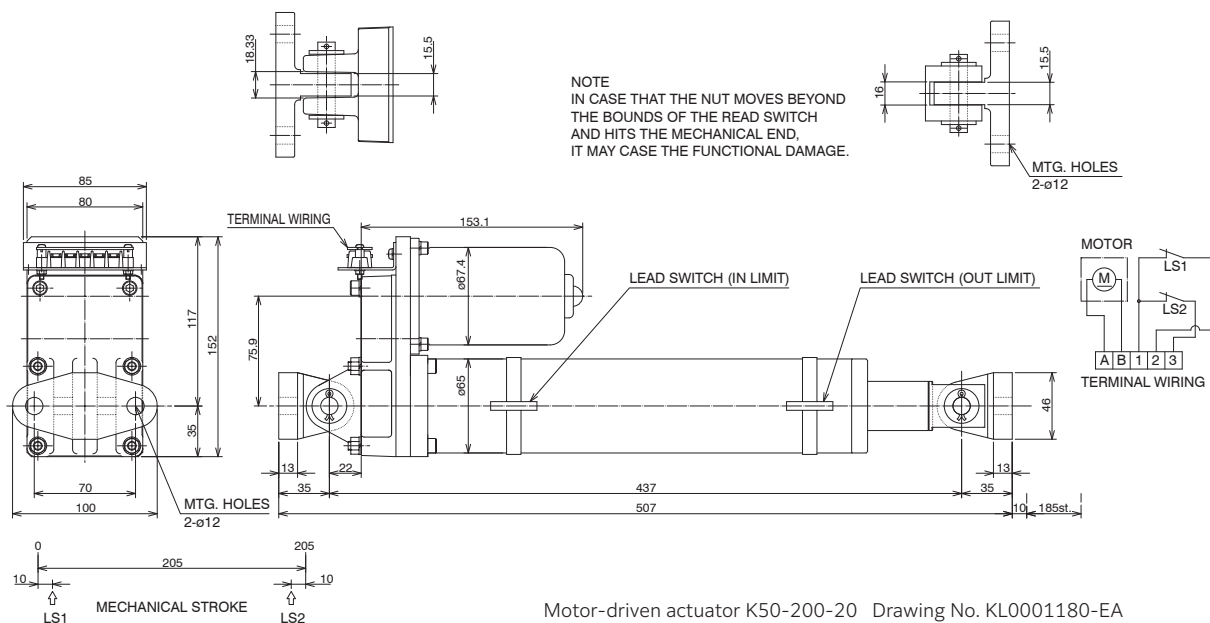




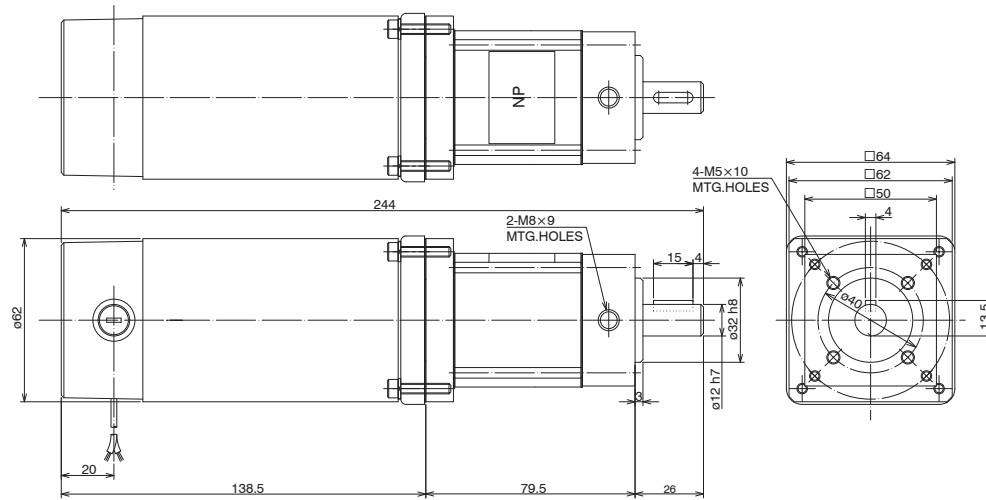
Motor-driven actuator K62-200-20 Drawing No. KL0000460-EA



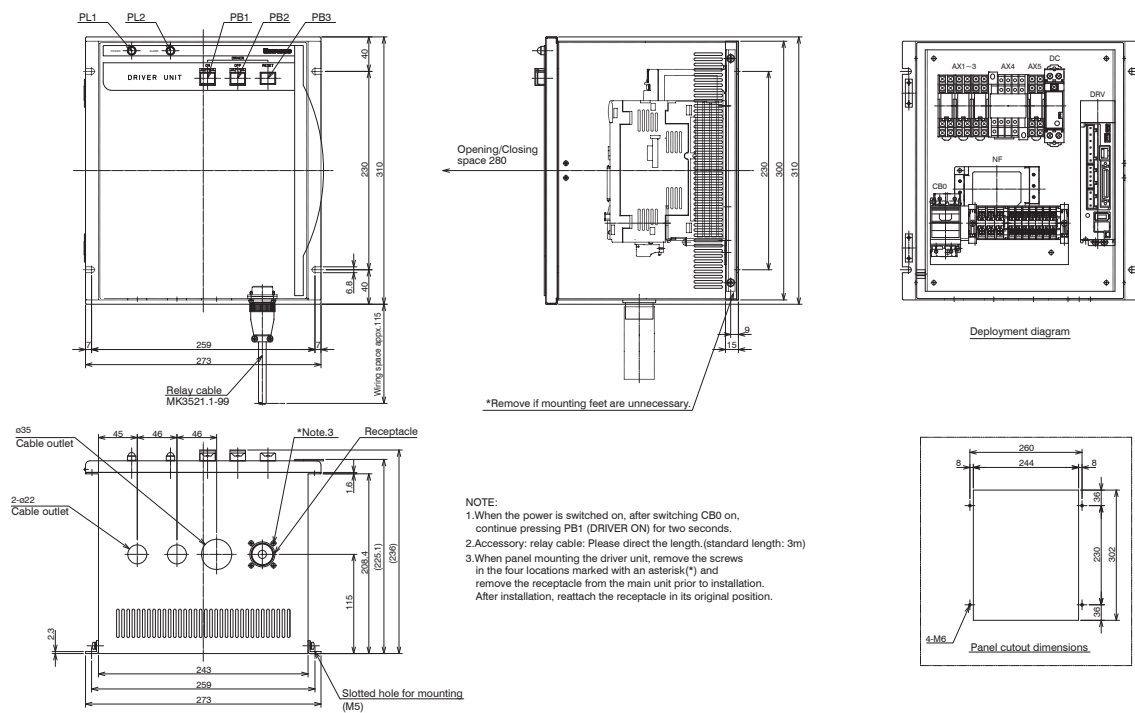
Motor-driven actuator K50-150-20 Drawing No. KL0001340-EA



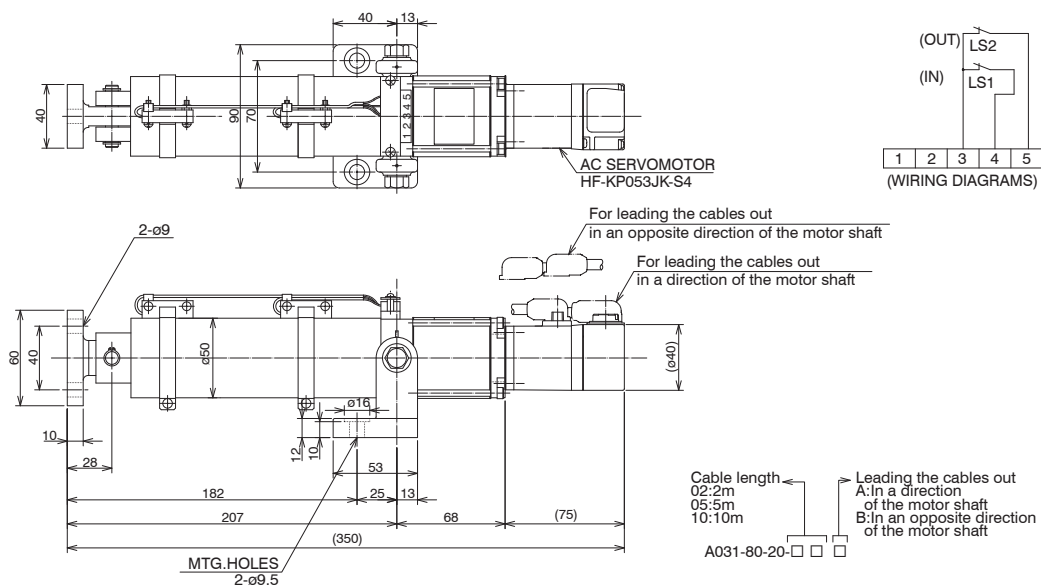
Motor-driven actuator K50-200-20 Drawing No. KL0001180-EA



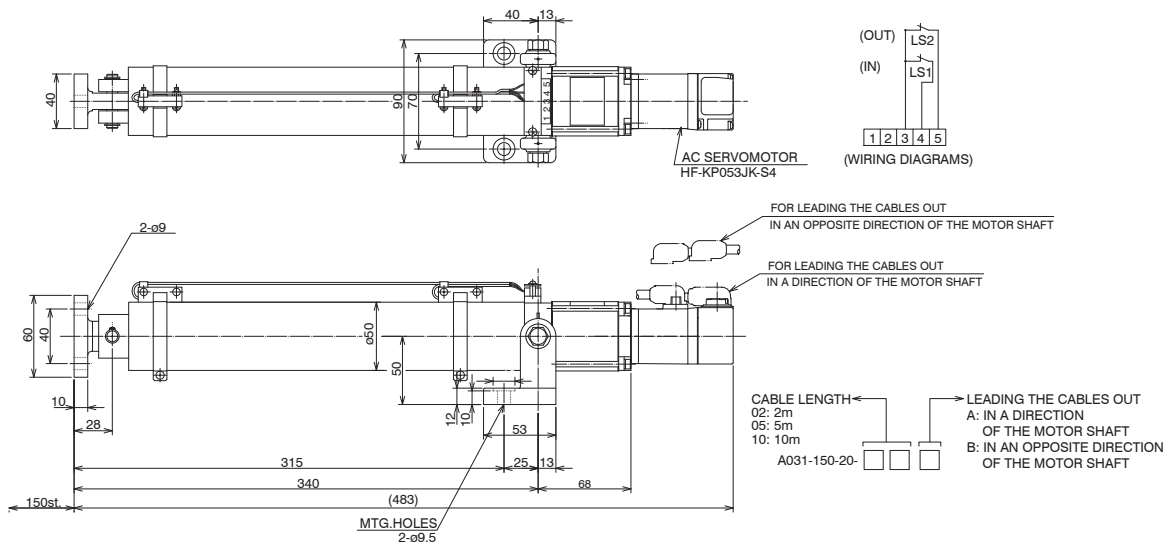
Motor-driven actuator K80-00 Drawing No. KL9015.0-EA



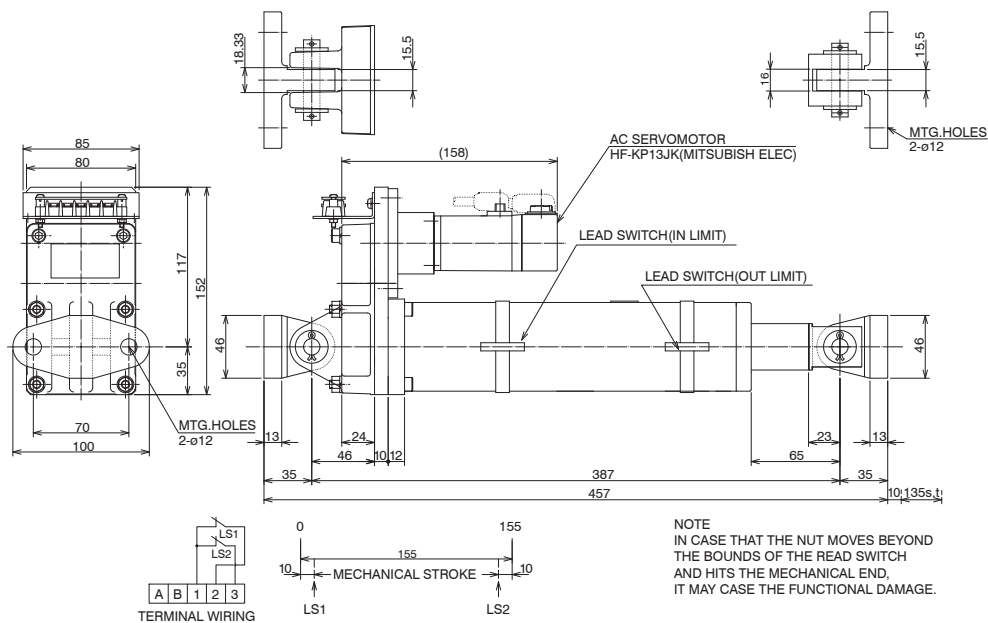
AC servo driver unit SP Drawing No. MK3521.3-EA



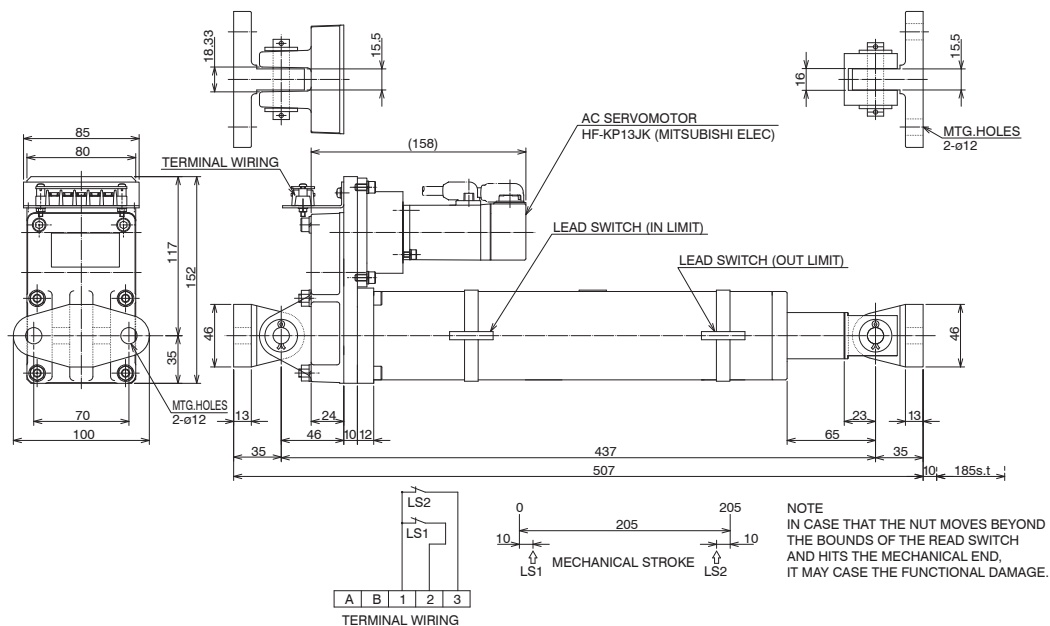
AC servo actuator A031-80-20-□□□ Drawing No. KL0000470-EA



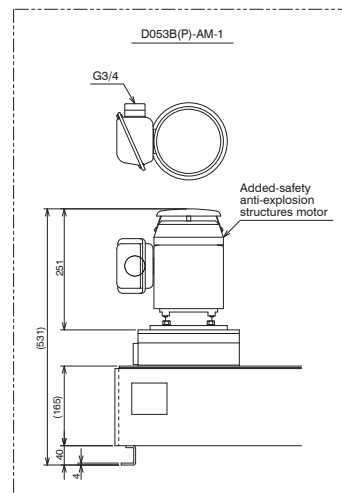
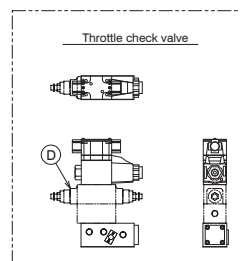
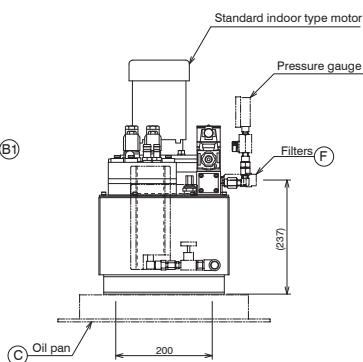
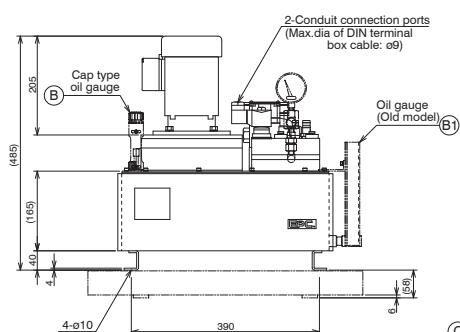
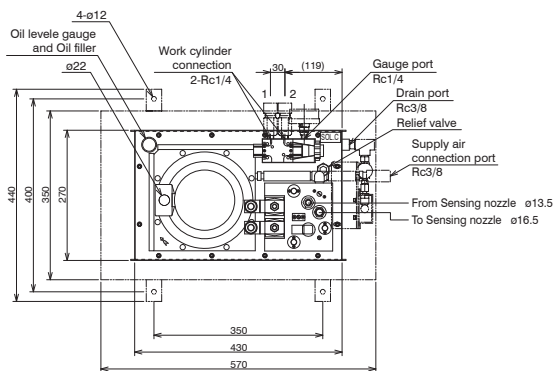
AC servo actuator A031-150-20-□□□ Drawing No. KL0001140-EA



AC servo actuator A151-150-20 Drawing No. KL0000480-EA



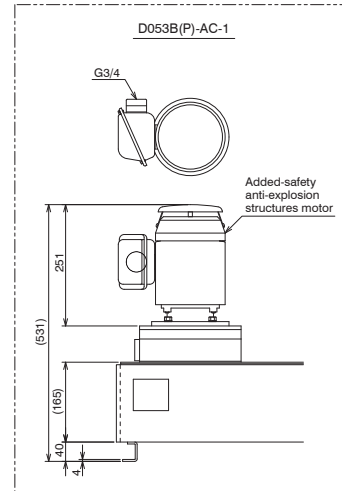
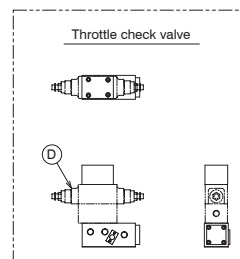
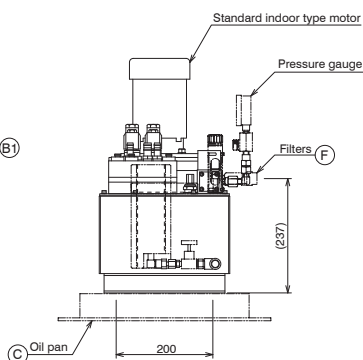
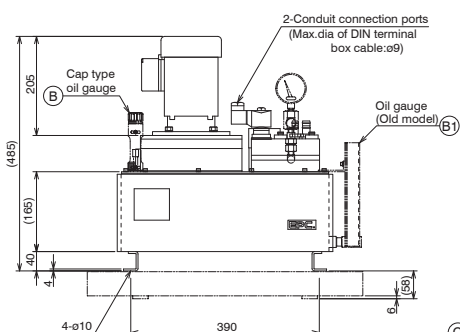
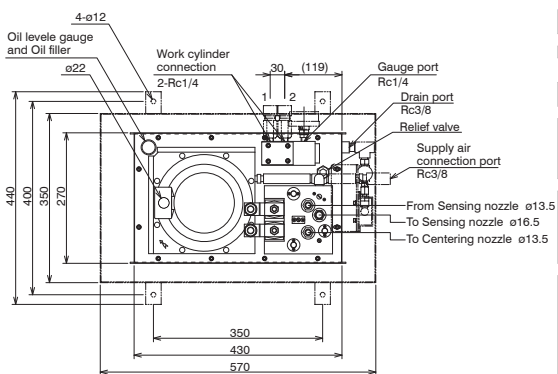
AC servo actuator A151-200-20 Drawing No. KL0000580-EA



Model	Max operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)	Installation
D053	1.0	2.0	0.2	12	2	-10~40	Approx.33	Horizontal

Blower	B	Built-in	Supply air: 40Pa 50L/min
Driving mode	AM	Auto/Manual	SOLA+ SOLB+ SOLC
Explosion protection standard	0	Standard indoor type	Standard type
	1	Added safety anti-explosion structures	Standard type
Motor power supply voltage	0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes it X, and write the voltage. When you chose Added safety anti-explosion structures you cannot choose '380V 50Hz' and '415V 50Hz'.
	1	220V 50Hz	
	2	380V 50Hz, 400V 50/60Hz	
	X	415V 50Hz, 440V 60Hz	
Solenoid power supply voltage	0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes it X, and write the voltage.
	1	100V 50/60Hz, 110V 60Hz	
	3	220V 50Hz	
	4	DC24V	
	X		
Option	A	Pressure gauge	Approx.0.5kg AD6807/0-38 Pressure range: 3MPa
	B	Cap type oil gauge	Approx.0.5kg AD6807/0-55
	B1	Oil gauge(old model)	Approx.1.5kg AD6807/0-52
	C	Oil pan	Approx.8.5kg AD6807/0-16
	D	Throttle check valve	Approx.2.5kg MT-02W-55 Bolt kit: M5×125(HB102) Spacer: BG-00AB-55 PT Plug: 1/4×10(2 pieces)
	F	Filter (Per one)	Approx.0.5kg AD6807/0-39
	N	A case without an option.	

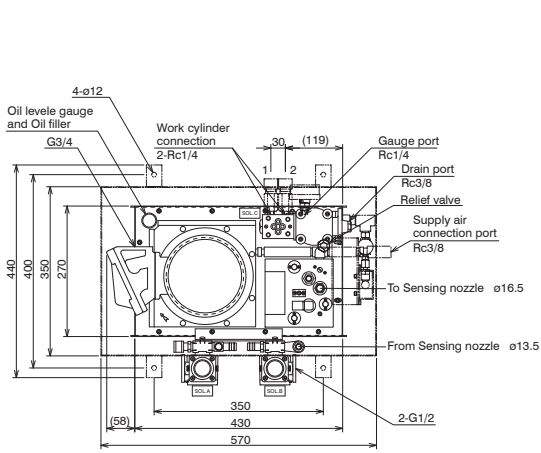
Servoguide MK-IV.D (Low-load type) MODEL D053B(P)-AM-0 D053B(P)-AM-1 Drawing No. AD6861.0-20E



Model	Max operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)	Installation
D053	1.0	2.0	0.2	12	2	-10~40	Approx.31	Horizontal

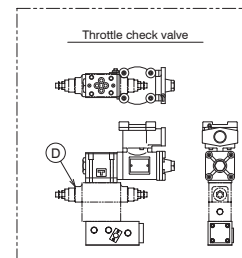
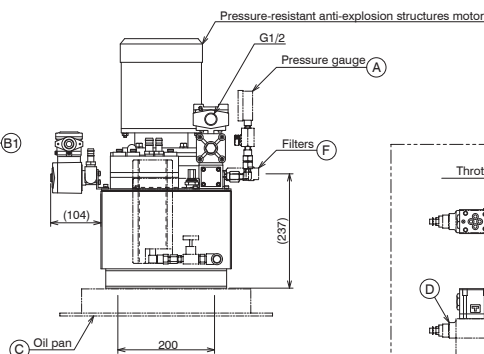
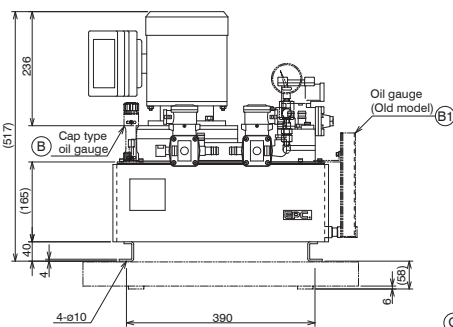
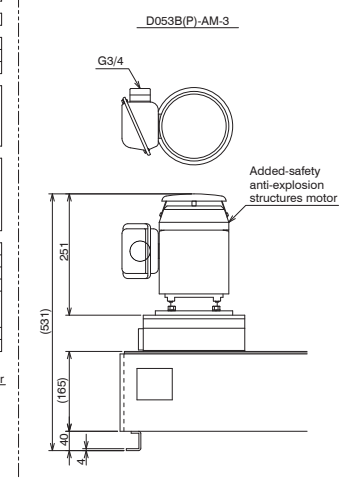
Blower	B	Built-in	Supply air: 40Pa 50L/min
Driving mode	AC	Auto/Centering	SOLA+ SOLB
Explosion protection standard	0	Standard indoor type	Standard type
	1	Added safety anti-explosion structures	Standard type
Motor power supply voltage	0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes it X, and write the voltage. When you chose Added safety anti-explosion structures you cannot choose '380V 50Hz' and '415V 50Hz'.
	1	220V 50Hz	
	2	380V 50Hz, 400V 50/60Hz	
	X	415V 50Hz, 440V 60Hz	
Solenoid power supply voltage	0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes it X, and write the voltage.
	1	100V 50/60Hz, 110V 60Hz	
	3	220V 50Hz	
	4	DC24V	
	X		
Option	A	Pressure gauge	Approx.0.5kg AD6807/0-38 Pressure range: 3MPa
	B	Cap type oil gauge	Approx.0.5kg AD6807/0-55
	B1	Oil gauge(old model)	Approx.1.5kg AD6807/0-52
	C	Oil pan	Approx.8.5kg AD6807/0-16
	D	Throttle check valve	Approx.2.5kg MT-02W-55 Bolt kit: M5×125(HB102) Spacer: BG-00AB-55 PT Plug: 1/4×10(2 pieces)
	F	Filter (Per one)	Approx.0.5kg AD6807/0-39
	N	A case without an option.	

Servoguide MK-IV.D (Low-load type) MODEL D053B(P)-AC-0 D053B(P)-AC-1 Drawing No. AD6861.0-40E

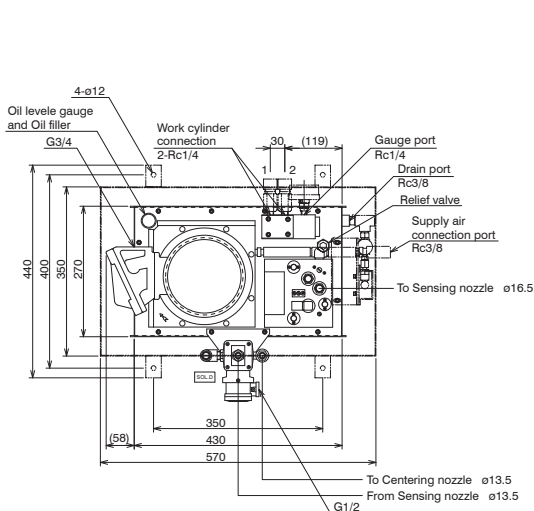


Model	Max. operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)	Installation
D053	1.0	2.0	0.4	12	2	-10~40	Approx.43	Horizontal

Blower	B	Built-in	Supply air: 4KPa 50L/min
Driving mode	AM	Auto/Manual	SOLA + SOLB + SOLC
Explosion protection standard	2	Pressure-resistant anti-explosion structures	Pressure-resistant anti-explosion structures
Explosion protection standard	3	Added-safety anti-explosion structures	Pressure-resistant anti-explosion structures
Motor power supply voltage	0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes it X, and write the voltage.
Motor power supply voltage	1	220V 50Hz	When you chose Added-safety anti-explosion structures, you cannot choose 200V 50Hz and 415V 50Hz.
Motor power supply voltage	2	380V 50Hz, 400V 50/60Hz	
Motor power supply voltage	3	415V 50Hz, 440V 60Hz	
Motor power supply voltage	X		
Solenoid power supply voltage	0	200V 50/60Hz	The voltage that is not written in the left assumes it X, and write the voltage.
Solenoid power supply voltage	1	100V 50/60Hz	
Solenoid power supply voltage	2	110V 50/60Hz	
Solenoid power supply voltage	3	220V 50/60Hz	
Solenoid power supply voltage	4	DC24V	
Solenoid power supply voltage	X		
Option	A	Pressure gauge	Approx.0.5kg AD6807.0-38 Pressure range:3MPa
Option	B	Cap type oil gauge	Approx.0.5kg AD6807.0-55
Option	B1	Oil gauge(old model)	Approx.1.5kg AD6807.0-22
Option	C	Oil pan	Approx.8.5kg AD6807.0-16
Option	D	Throttle check valve	MT-02W-55 Bolt kit:MS×135
Option	E	Spacer-BG-02AB-55	PT Plug:1/4×10(2 pieces)
Option	F	Filter (Per one)	Approx.0.5kg AD6807.0-39
Option	N	A case without an option.	

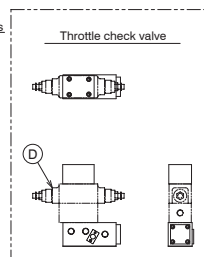
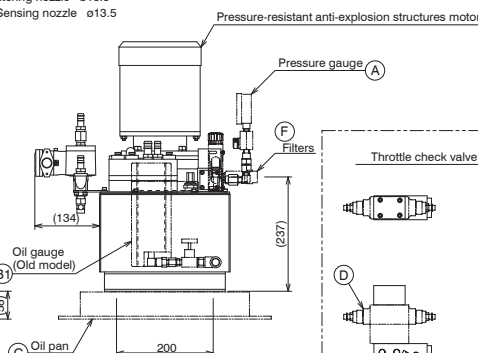
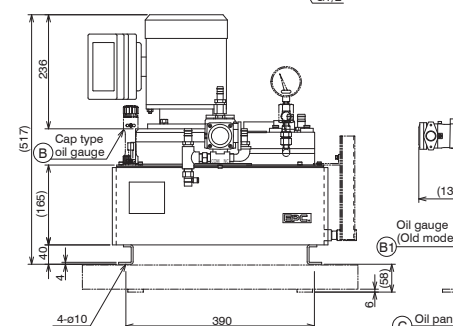
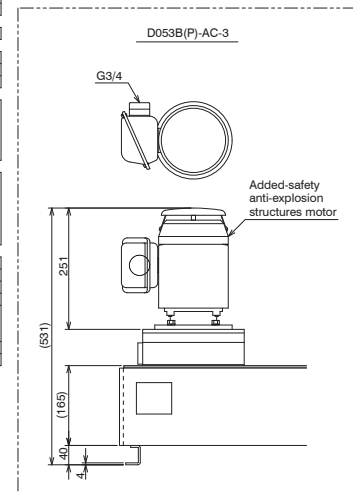


Servoguide MK-IV.D (Low-load type) (pressure-resistant explosion-proof) MODEL D053B(P)-AM-2 Drawing No. AD6862.0-20E

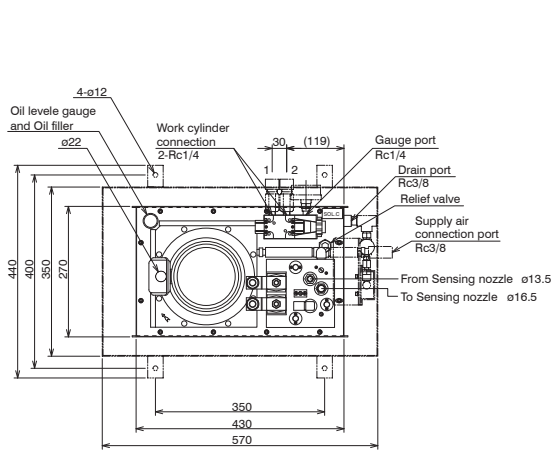


Model	Max. operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)	Installation
D053	1.0	2.0	0.4	12	2	-10~40	Approx.41	Horizontal

Blower	B	Built-in	Supply air: 4KPa 50L/min
Driving mode	AC	Auto/Centering	SOLA + SOLB + SOLC
Explosion protection standard	2	Pressure-resistant anti-explosion structures	Pressure-resistant anti-explosion structures
Explosion protection standard	3	Added-safety anti-explosion structures	Pressure-resistant anti-explosion structures
Motor power supply voltage	0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes it X, and write the voltage.
Motor power supply voltage	1	220V 50Hz	When you chose Added-safety anti-explosion structures, you cannot choose 200V 50Hz and 415V 50Hz.
Motor power supply voltage	2	380V 50Hz, 400V 50/60Hz	
Motor power supply voltage	3	415V 50Hz, 440V 60Hz	
Motor power supply voltage	X		
Solenoid power supply voltage	0	200V 50/60Hz	The voltage that is not written in the left assumes it X, and write the voltage.
Solenoid power supply voltage	1	100V 50/60Hz	
Solenoid power supply voltage	2	110V 50/60Hz	
Solenoid power supply voltage	3	220V 50/60Hz	
Solenoid power supply voltage	4	DC24V	
Solenoid power supply voltage	X		
Option	A	Pressure gauge	Approx.0.5kg AD6807.0-38 Pressure range:3MPa
Option	B	Cap type oil gauge	Approx.0.5kg AD6807.0-55
Option	B1	Oil gauge(old model)	Approx.1.5kg AD6807.0-22
Option	C	Oil pan	Approx.8.5kg AD6807.0-16
Option	D	Throttle check valve	MT-02W-55 Bolt kit:MS×135
Option	E	Spacer-BG-02AB-55	PT Plug:1/4×10(2 pieces)
Option	F	Filter (Per one)	Approx.0.5kg AD6807.0-39
Option	N	A case without an option.	

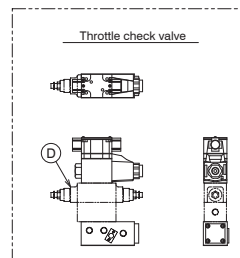
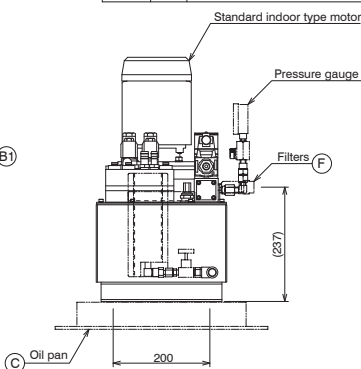
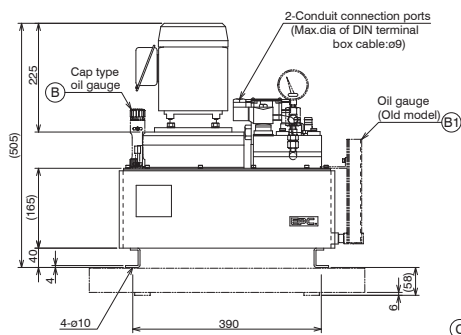
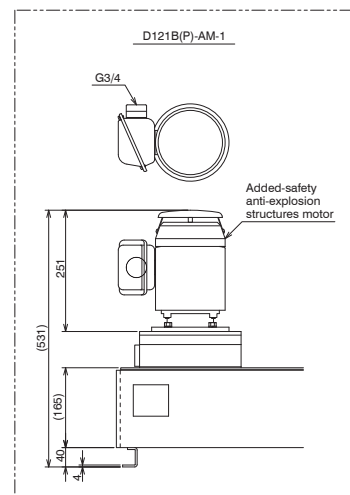


Servoguide MK-IV.D (Low-load type) (pressure-resistant explosion-proof) MODEL D053B(P)-AC-2 Drawing No. AD6862.0-40E

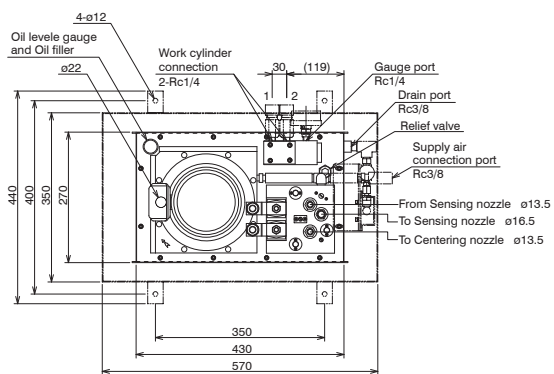


Model		Max operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)	Installation
D121		1.5	4.2	0.4	12	2	-10~40	Approx.33	Horizontal

Blower	B	Built in	Supply air: 4kPa 50L/min						
	I	Plant air							
Driving mode	AM	Auto/Manual	SOL A + SOL B + SOL C						
	I	Motor	Solenoid						
Explosion protection standard	0	Standard indoor type	Standard type						
	1	Added-safety anti-explosion structures	Standard type						
Motor power supply voltage	0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes 0 X, and write the voltage. When you choose Adesky anti-explosion structures, you cannot choose 380V 50Hz and 415V 50Hz/60Hz.						
	1	220V 50Hz							
	2	380V 50Hz, 400V 50/60Hz							
	3	415V 50Hz, 440V 60Hz							
	X								
Solenoid power supply voltage	0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes 0 X, and write the voltage.						
	1	100V 50/60Hz, 110V 60Hz							
	2	110V 50Hz							
	3	220V 50Hz							
	4	DC24V							
	X								
Option	I	Pressure gauge	Approx. 0.5kg	AD6807-0-38 Pressure range: 3MPa					
	B	Cap type oil gauge	Approx. 0.5kg	AD6807-0-55					
	B1	Oil gauge (old model)	Approx. 1.5kg	AD6807-0-22					
	C	Oil pan	Approx. 8.5kg	AD6807-0-16					
	D	Throttle check valve	Approx. 2.5kg	MT-02W-05 Bolt kit: M5×125(HB102) Spacer: BG-00AB-55					
	F	Filter (Per one)	Approx. 0.5kg	PT Plug: 1/4×10(2 pieces)					
	N	A case without an option.		AD6807-0-39					



Servoguide MK-IV.D (Single type) MODEL D121B(P)-AM-0 D121B(P)-AM-1 Drawing No. AD6863.0-20E



Model

Max operating pressure (MPa)

Pump capacity (L/min)

Motor output (kW)

Oil required (L)

Motor pole number (P)

Ambient temperature (°C)

Mass (kg)

Installation

D121

1.5

4.2

0.4

12

2

-10~40

Approx.31

Horizontal

Blower

B

Built in

Supply air: 4kPa 50L/min

Driving mode

AC

Auto/Centering

SOL A + SOL B

Explosion protection standard

0

Standard indoor type

Standard type

1

Added-safety anti-explosion structures

Standard type

Motor power supply voltage

0

200V 50/60Hz, 220V 60Hz

The voltage that is not written in the left assumes 0 X, and write the voltage.

1

220V 50Hz

2

380V 50Hz, 400V 50/60Hz

When you choose Adco-Safety anti-explosion structures, you cannot choose 380V 50Hz, and 415V 50Hz.

3

415V 50Hz, 440V 60Hz

X

Solenoid power supply voltage

0

200V 50/60Hz, 220V 60Hz

The voltage that is not written in the left assumes 0 X, and write the voltage.

1

100V 50/60Hz, 110V 60Hz

2

110V 50Hz

3

220V 50Hz

4

DC24V

X

Option

A

Pressure gauge

Approx. 0.5kg

AD6807-0-38

Pressure range: 3MPa

B

Cap type oil gauge

Approx. 0.5kg

AD6807-0-55

B1

Oil gauge (old model)

Approx. 1.5kg

AD6807-0-22

C

Oil pan

Approx. 8.5kg

AD6807-0-16

D

Throttle check valve

Approx. 2.5kg

MT-02W-05

Bolt kit: M5×125(HB102)

F

Filter (Per one)

Approx. 0.5kg

PT Plug: 1/4×10(2 pieces)

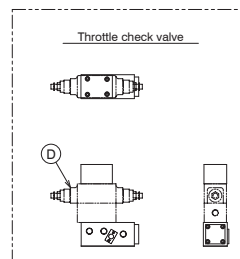
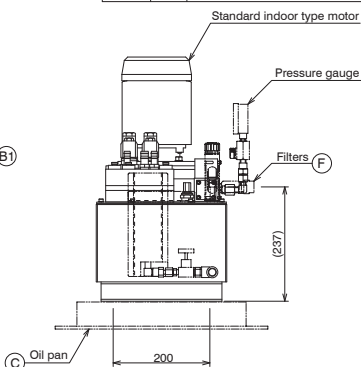
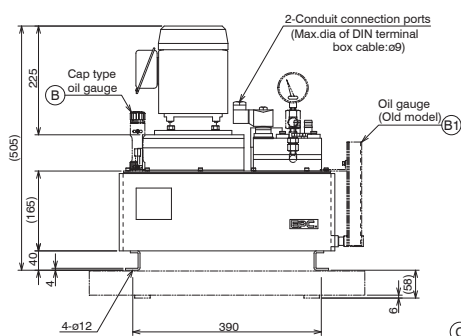
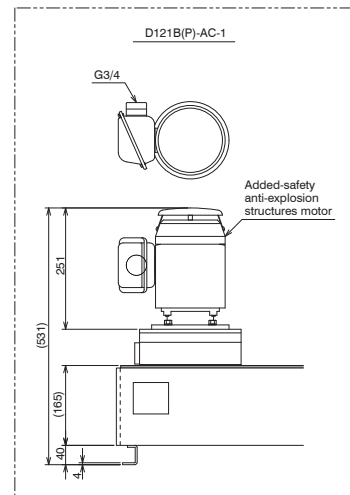
N

A case without an option.

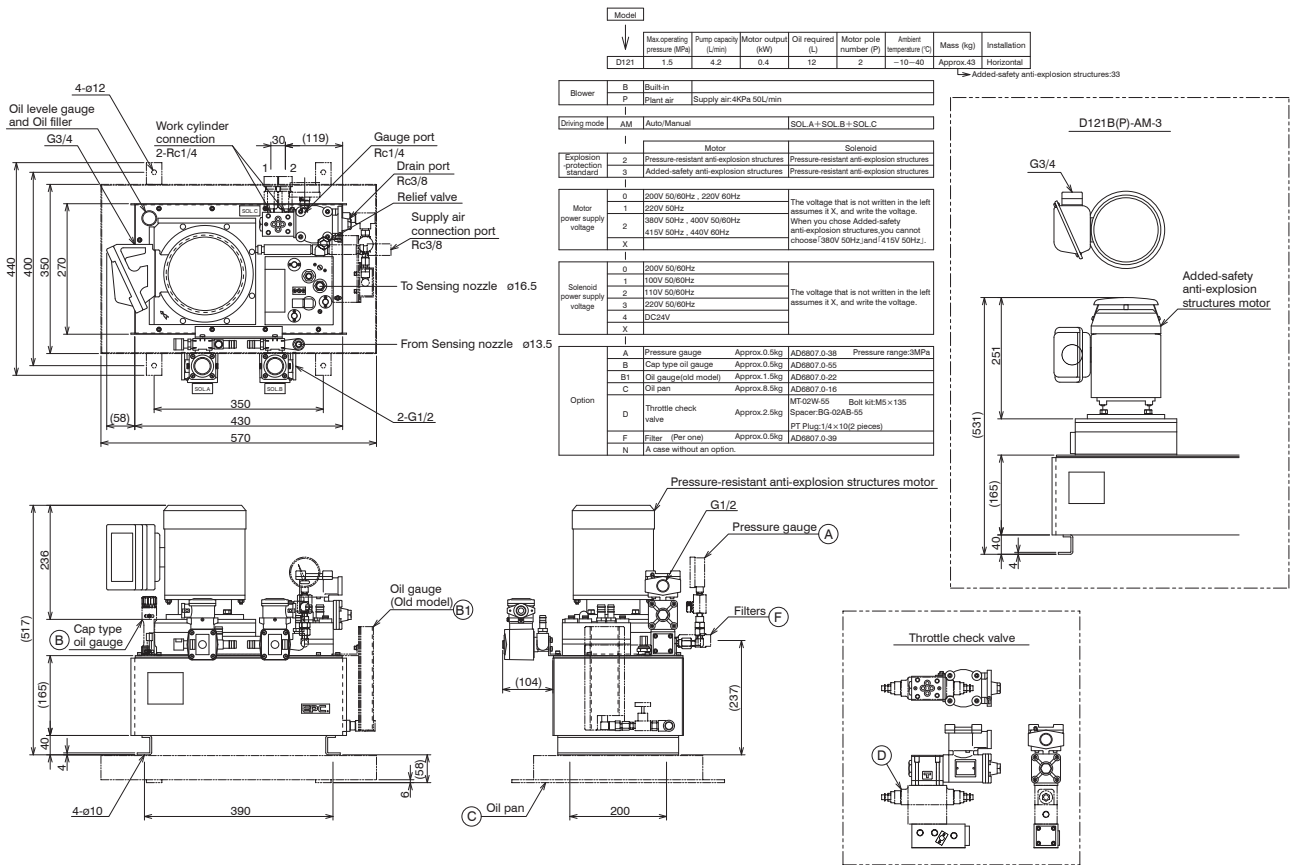
AD6807-0-39

251

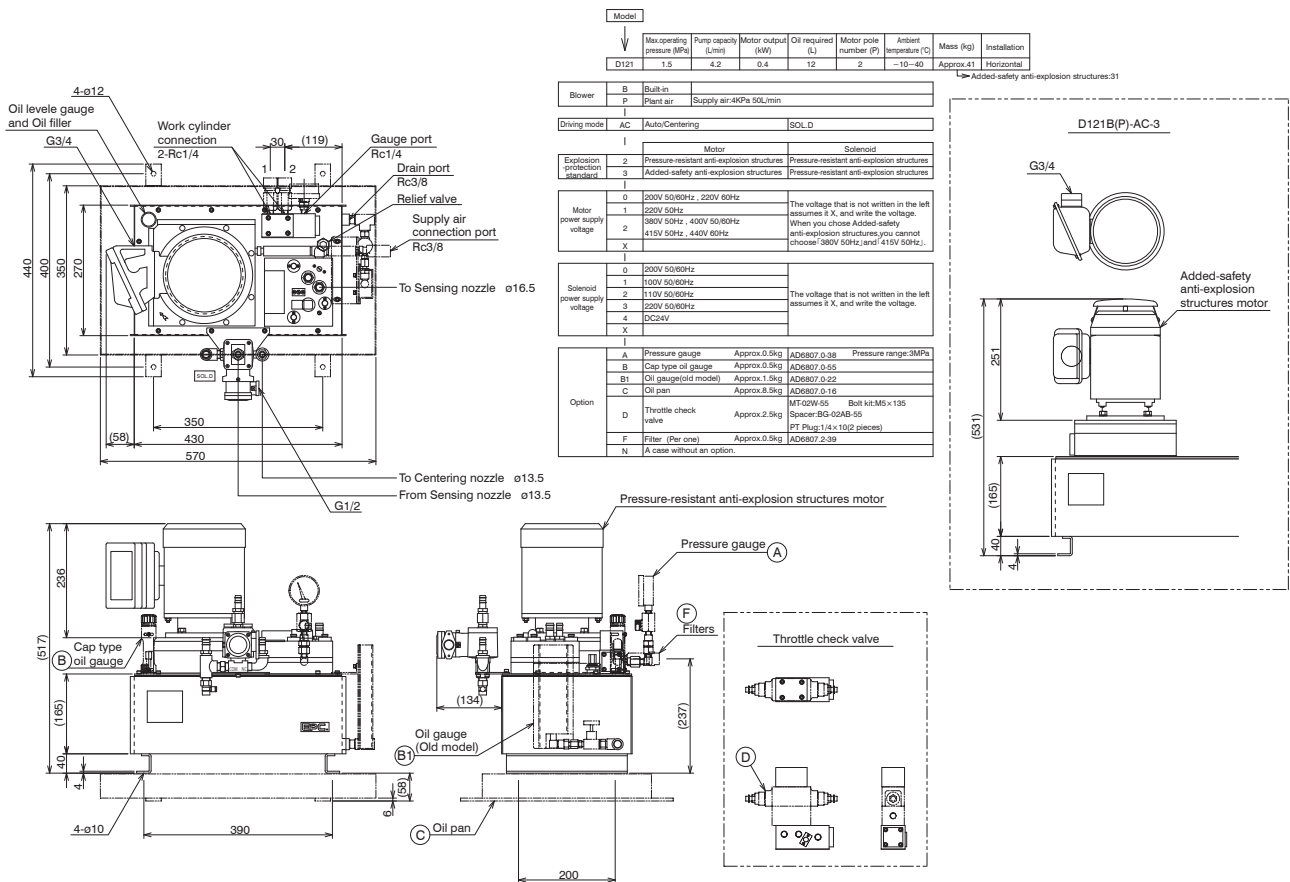
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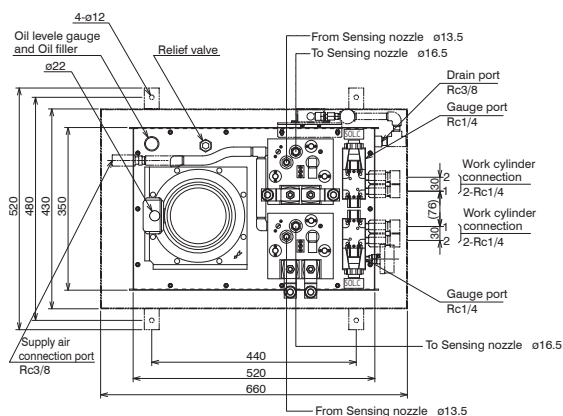
Servoguide MK-IV.D (Single type) MODEL D121B(P)-AC-0 D121B(P)-AC-1 Drawing No. AD6863.0-40E



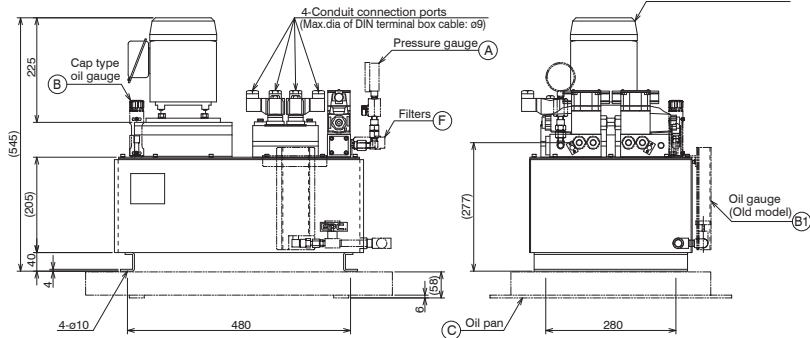
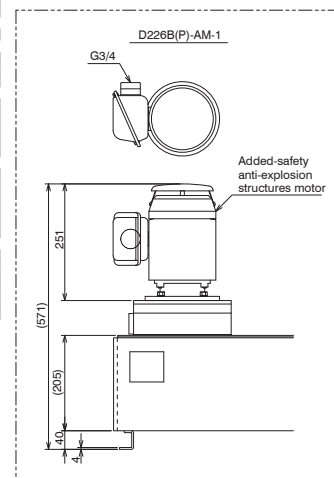
Servoguide MK-IV.D (Single type) (pressure-resistant explosion-proof) MODEL D121B(P)-AM-2 Drawing No. AD6864.0-20E



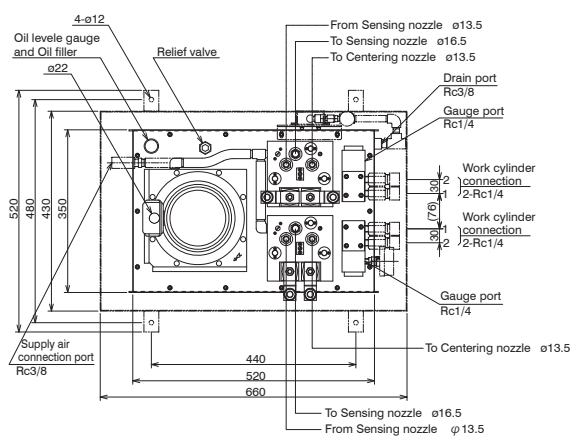
Servoguide MK-IV.D (Single type) (pressure-resistant explosion-proof) MODEL D121B(P)-AC-2 Drawing No. AD6864.0-40E



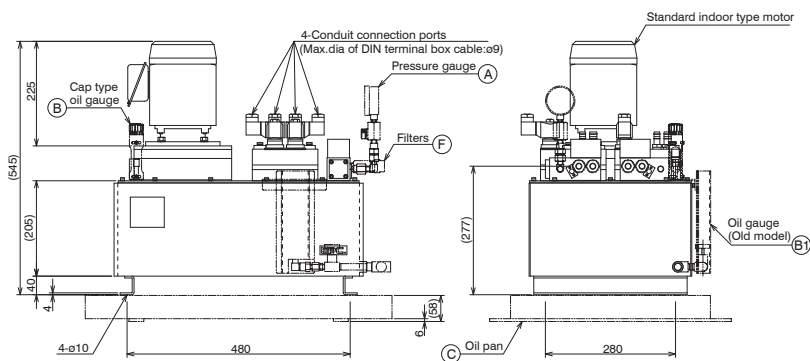
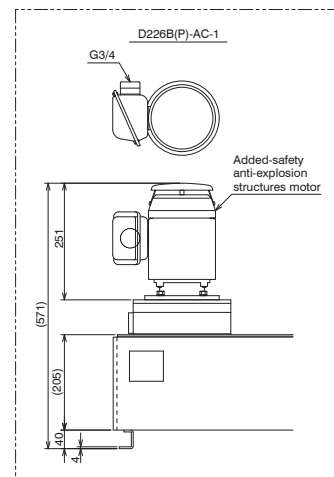
Model									
	Max. operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)	Installation	
	D226	1.5	4.2	0.4	26	2	-10~40	Approx. 44	Horizontal
Blower	B	Built in							
	P	Plant air							
		Supply air: 4KPa 50L/min							
Driving mode	AM	Auto/Manual							
		SOL A + SOL B + SOL C							
Explosion protection standard	0	Motor			Solenoid				
	0	Standard indoor type			Standard type				
	1	Added safety anti-explosion structures			Standard type				
Motor power supply voltage	0	200V 50/60Hz, 220V 60Hz			The voltage that is not written in the left assumes it X, and write the voltage. When you choose Added safety anti-explosion structures, you cannot choose 380V 50Hz and 415V 50Hz.				
	1	220V 50Hz							
	2	380V 50Hz, 400V 50/60Hz							
	3	415V 50Hz, 440V 60Hz							
	X								
Solenoid power supply voltage	0	200V 50/60Hz, 220V 60Hz			The voltage that is not written in the left assumes it X, and write the voltage.				
	1	100V 50/60Hz, 110V 60Hz							
	2	220V 50Hz							
	3	220V 50Hz							
	4	DC24V							
Option	X								
	A	Pressure gauge	Approx. 0.5kg	AD6807.0-38		Pressure range: 3MPa			
	B	Cap type oil gauge	Approx. 0.5kg	AD6807.0-55		Pressure range: 3MPa			
	B1	Oil gauge (old model)	Approx. 1.5kg	AD6807.0-29		Pressure range: 3MPa			
	C	Oil pan	Approx. 1.1kg	AD6807.0-18		Pressure range: 3MPa			
	F	Filter (Per one)	Approx. 0.5kg	AD6807.0-39		Pressure range: 3MPa			
	N	A case without an option.							



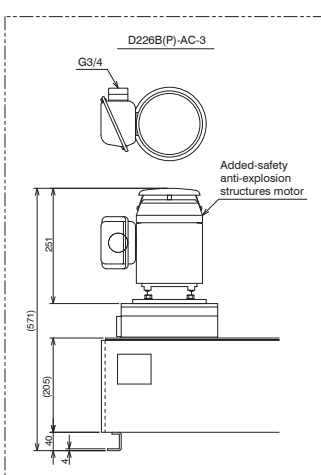
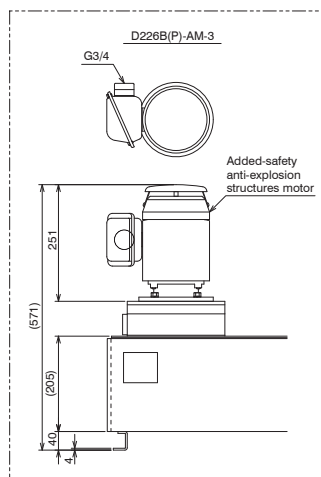
Servoguide MK-IV.D (Twin type) MODEL D226B(P)-AM-0 D226B(P)-AM-1 Drawing No. AD6865.0-20E

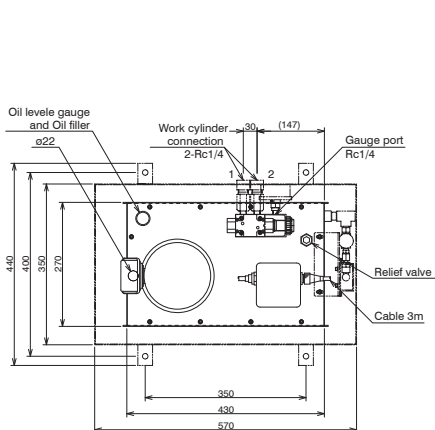


Model								
	Max. operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)	Installation
D226	1.5	4.2	0.4	26	2	-10~40	Approx. 42	Horizontal
Blower								
B	Built in							
P	Plant air							
	Supply air: 4KPa 50L/min							
Driving mode								
AC	Auto/Centering SOL A + SOL B							
Explosion protection standard								
I	Motor							
0	Standard indoor type							
1	Added safety anti-explosion structures							
Solenoid								
0	Standard type							
1	Standard type							
Motor power supply voltage								
0	200V 50/60Hz, 220V 60Hz							
1	220V 50Hz							
2	380V 50Hz, 400V 50/60Hz, 415V 50Hz, 440V 60Hz							
X	The voltage that is not written in the left assumes it X, and write the voltage. When you choose Added safety anti-explosion structures, you cannot choose 380V 50Hz and 415V 50Hz.							
Solenoid power supply voltage								
0	200V 50/60Hz, 220V 60Hz							
1	100V 50/60Hz, 110V 60Hz							
2	220V 50Hz							
3	220V 50Hz							
4	DC24V							
X	The voltage that is not written in the left assumes it X, and write the voltage.							
Option								
A	Pressure gauge	Approx. 0.5kg	AD6807.0-38	Pressure range: 3MPa				
B	Cap type oil gauge	Approx. 0.5kg	AD6807.0-55	Pressure range: 3MPa				
B1	Oil gauged model	Approx. 1.5kg	AD6807.0-29	Pressure range: 3MPa				
C	Oil pan	Approx. 1.1kg	AD6807.0-18	Pressure range: 3MPa				
F	Filter (Per one)	Approx. 0.5kg	AD6807.0-39	Pressure range: 3MPa				
N	A case without an option.							



Servoguide MK-IV.D (Twin type) MODEL D226B(P)-AC-0 D226B(P)-AC-1 Drawing No. AD6865.0-40E





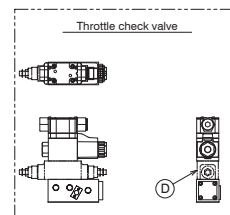
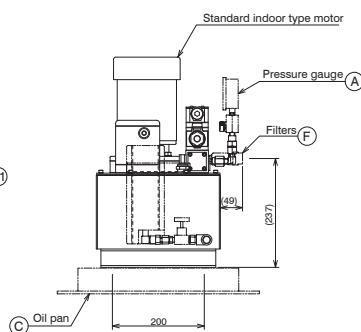
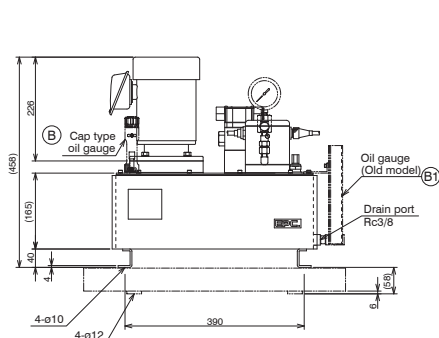
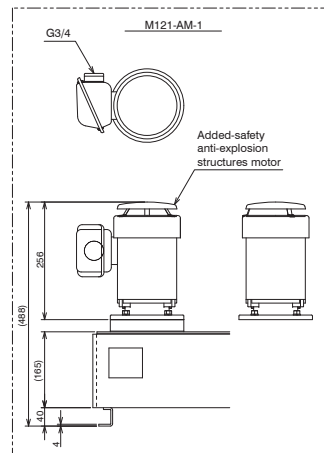
Model							
	Max. operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)
M121	1.5	4.2	0.4	12	4	-10~40	Approx.32

AM		
Explosion protection standard		Motor
0	Standard indoor type	Standard type
1	Added safety anti-explosion structures	Standard type

Motor power supply voltage		Motor
0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes X, and write the voltage. When you chose Added safety anti-explosion structures, you cannot choose 380V 50Hz, and 415V 50Hz.
1	220V 50Hz	
2	400V 50/60Hz, 440V 60Hz	
X	380V 50Hz, 415V 50Hz	

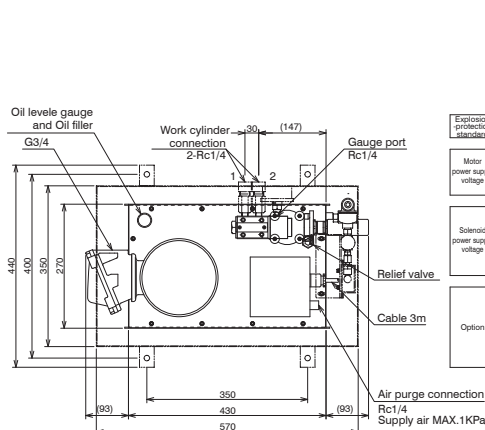
Solenoid power supply voltage		Solenoid
0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes X, and write the voltage.
1	100V 50/60Hz, 110V 60Hz	
2	110V 50Hz	
3	220V 50Hz	
4	DC24V	
X		

Option		
A	Pressure gauge	Approx.0.5kg AD6807-0-38 Pressure range 3.5MPa
B	Cap type oil gauge	Approx.0.5kg AD6807-1-55
B1	Oil gauge(old model)	Approx.1.5kg AD6807-0-22
C	Oil pan	Approx.8.5kg AD6807-0-16
D	Throttle check valve	Approx.1.5kg MT-02W-55 Bolt kit M5×85 (H8101)
F	Filter (Per one)	Approx.0.5kg AD6807-2-39
N	A case without an option.	



Servoguide MK-IV.M (Single type) MODEL M121-AM-0 M121-AM-1 Drawing No. AD6855.0-20E

These devices do not have explosion-proof certification.



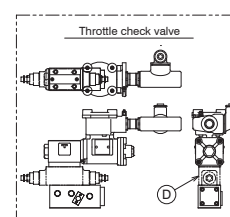
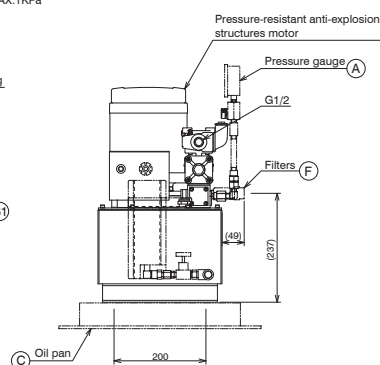
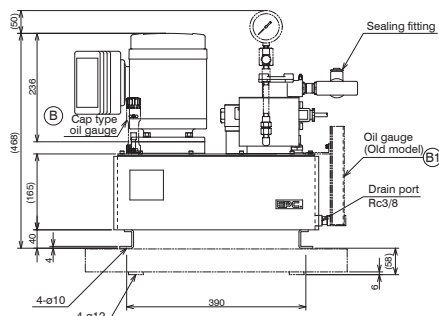
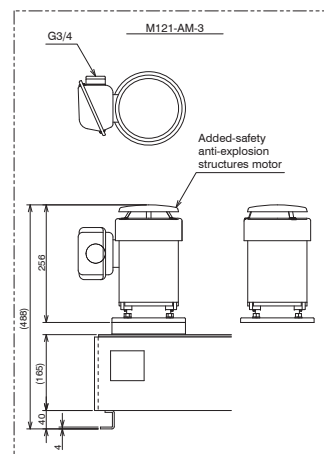
Model							
	Max. operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)
M121	1.5	4.2	0.4	12	4	-10~40	Approx.42

AM		
Explosion protection standard		Motor
2	Pressure-resistant anti-explosion structures	Pressure-resistant anti-explosion structures
3	Added safety anti-explosion structures	Pressure-resistant anti-explosion structures

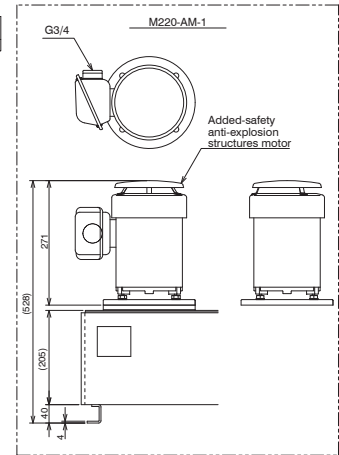
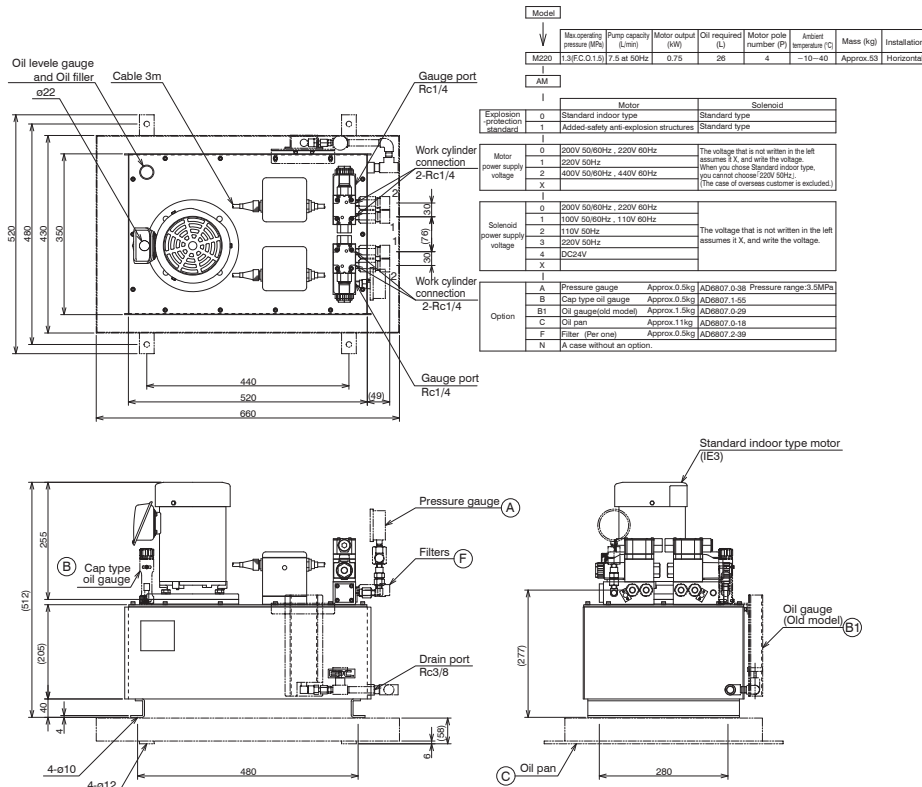
Motor power supply voltage		Motor
0	200V 50/60Hz, 220V 60Hz	The voltage that is not written in the left assumes X, and write the voltage.
1	220V 50Hz	
2	400V 50/60Hz, 440V 60Hz	
X		

Solenoid power supply voltage		Solenoid
0	200V 50/60Hz	The voltage that is not written in the left assumes X, and write the voltage.
1	100V 50/60Hz	
2	110V 50/60Hz	
3	220V 50/60Hz	
4	DC24V	
X		

Option		
A	Pressure gauge	Approx.0.5kg AD6807-0-38 Pressure range 3.5MPa
B	Cap type oil gauge	Approx.0.5kg AD6807-1-55
B1	Oil gauge(old model)	Approx.1.5kg AD6807-0-22
C	Oil pan	Approx.8.5kg AD6807-0-16
D	Throttle check valve	Approx.1.5kg MT-02W-55 Bolt kit M5×95
F	Filter (Per one)	Approx.0.5kg AD6807-2-39
N	A case without an option.	

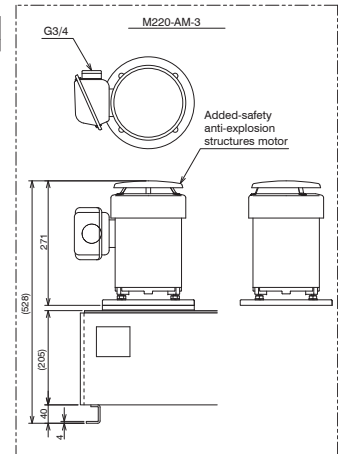
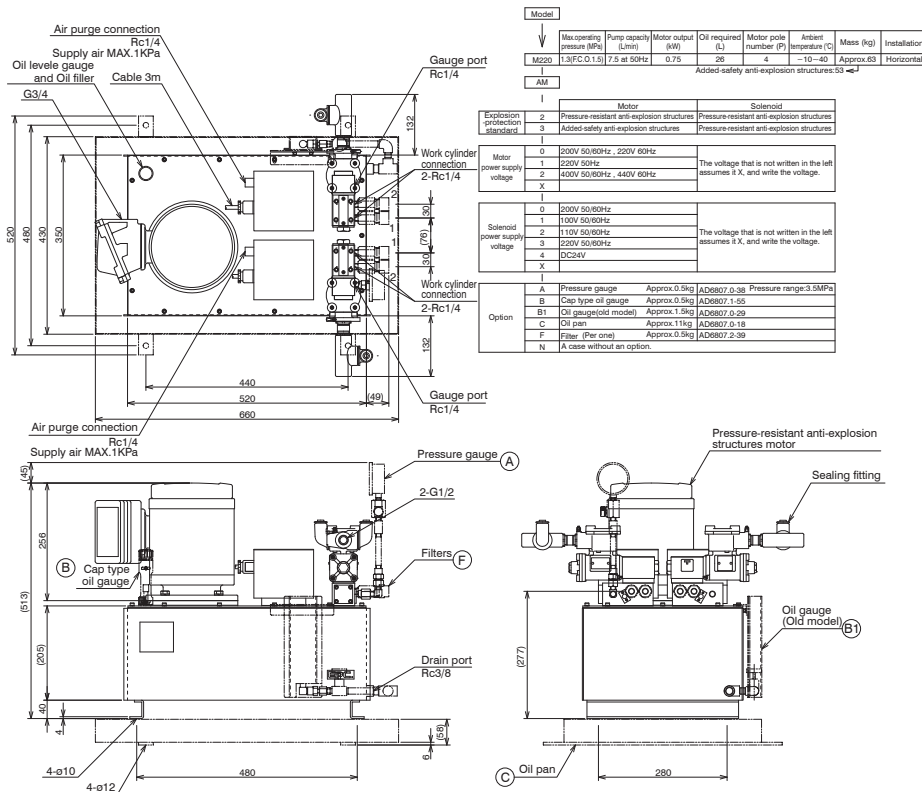


Servoguide MK-IV.M (Single type) (explosion-proof type solenoid valve and motor) MODEL M121-AM-2 M121-AM-3 Drawing No. AD6856.0-20E

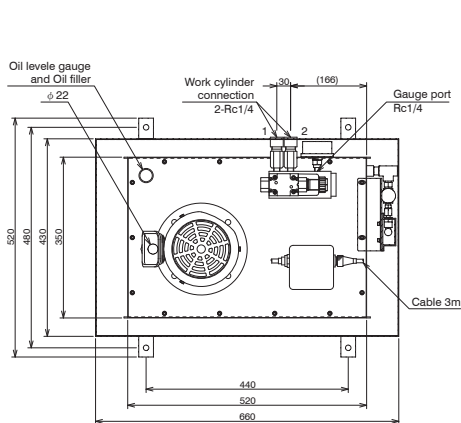


Servoguide MK-IV.M (Twin type) MODEL M220-AM-0 M220-AM-1 Drawing No. AD6857.0-20E

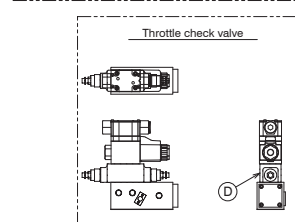
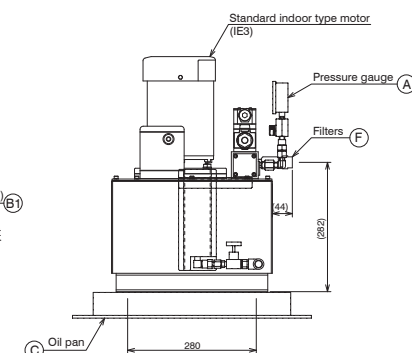
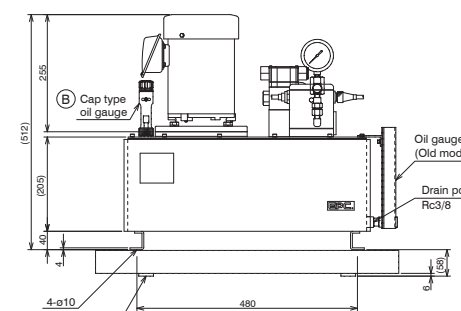
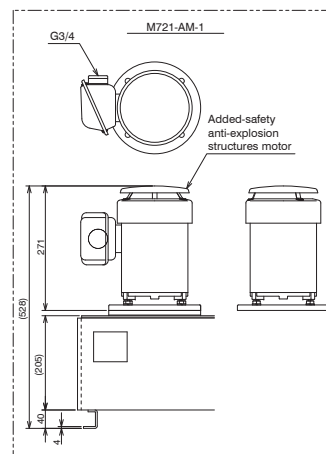
These devices do not have explosion-proof certification.



Servoguide MK-IV.M (Twin type) (explosion-proof type solenoid valve and motor) MODEL M220-AM-2 M220-AM-3 Drawing No. AD6858.0-20E

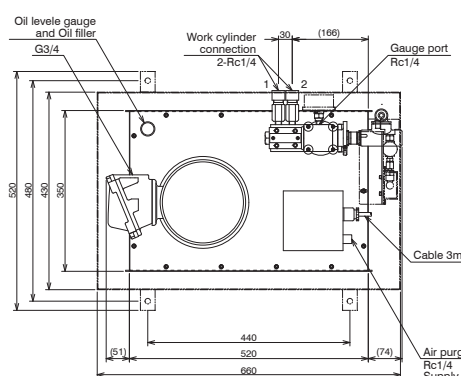


Model	Max. operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)	Installation
M721	2.5/FC 0.3/0	7.5 at 50Hz	0.75	26	4	-10~40	Approx. 49	Horizontal
AM								
I		Motor		Solenoid				
Explosion protection standard		0 Standard indoor type		Standard type				
1		Added safety anti-explosion structures		Standard type				
I		0		200V 50/60Hz, 220V 60Hz				
Motor power supply voltage		1		220V 50Hz				
2		400V 50/60Hz, 440V 60Hz		The voltage that is not written in the left assumes I X, and write the voltage. When you chose Standard indoor type, you named chose 200V 50Hz. (The case of overseas customer is excluded)				
X								
I		0		200V 50/60Hz, 220V 60Hz				
Solenoid power supply voltage		1		100V 50/60Hz, 110V 60Hz				
2		110V 50Hz		The voltage that is not written in the left assumes I X, and write the voltage.				
3		220V 50Hz						
4		DC24V						
X								
I		A		Pressure gauge Approx. 0.5kg AD6807-0-38 Pressure range 5MPa				
Option		B		Cap type oil gauge Approx. 0.5kg AD6807-1-55				
B1		Oil gauge (old model) Approx. 1.5kg AD6807-0-48						
C		Oil pan Approx. 1.1kg AD6807-0-18						
D		Throttle check valve Approx. 1.5kg MT200W-55 Bolt kit: M5 x B5 (H#101)						
F		Filter (Per one) Approx. 0.5kg AD6807-2-38 Equipped normally.						
N		A case without an option.						

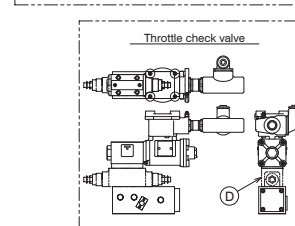
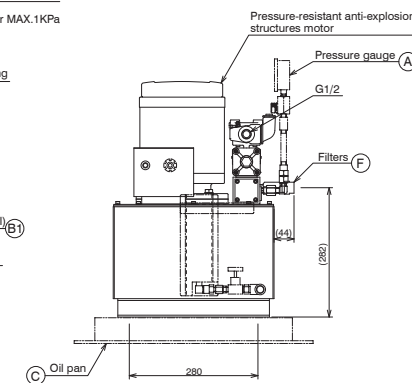
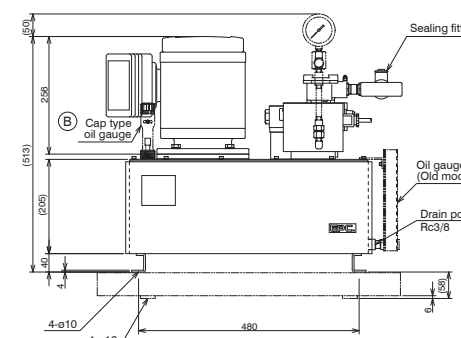
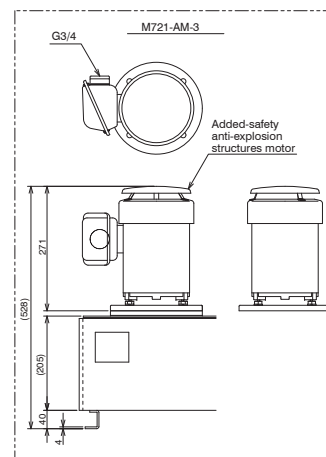


Servoguide MK-IV.M (High-load type) MODEL M721-AM-0 Drawing No. AD6859.0-20E
M721-AM-1

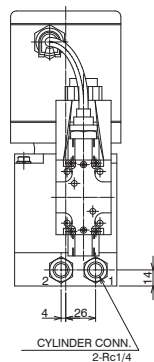
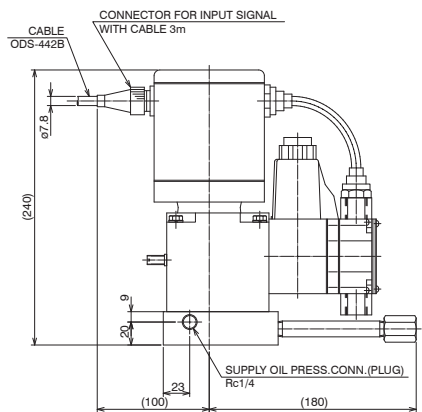
These devices do not have explosion-proof certification.



Model	Max. operating pressure (MPa)	Pump capacity (L/min)	Motor output (kW)	Oil required (L)	Motor pole number (P)	Ambient temperature (°C)	Mass (kg)	Installation
M721	2.5/FC 0.3/0	7.5 at 50Hz	0.75	26	4	-10~40	Approx. 59	Horizontal
AM								
I		Motor		Solenoid				
Explosion protection standard		2 Pressure-resistant anti-explosion structures		Pressure-resistant anti-explosion structures				
3		Added safety anti-explosion structures		Pressure-resistant anti-explosion structures				
I		0		200V 50/60Hz, 220V 60Hz				
Motor power supply voltage		1		220V 50Hz				
2		400V 50/60Hz, 440V 60Hz		The voltage that is not written in the left assumes I X, and write the voltage.				
X								
I		0		200V 50/60Hz				
Solenoid power supply voltage		1		100V 50/60Hz				
2		110V 50/60Hz		The voltage that is not written in the left assumes I X, and write the voltage.				
3		220V 50/60Hz						
4		DC24V						
X								
I		A		Pressure gauge Approx. 0.5kg AD6807-0-38 Pressure range 5MPa				
Option		B		Cap type oil gauge Approx. 0.5kg AD6807-1-55				
B1		Oil gauge (old model) Approx. 1.5kg AD6807-0-48						
C		Oil pan Approx. 1.1kg AD6807-0-18						
D		Throttle check valve Approx. 1.5kg MT200W-55 Bolt kit: M5 x B5						
F		Filter (Per one) Approx. 0.5kg AD6807-2-38 Equipped normally.						
N		A case without an option.						

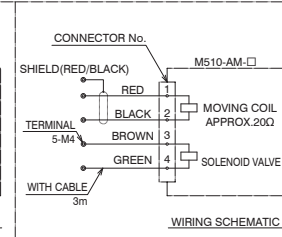
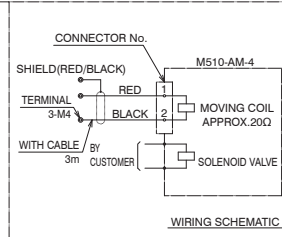
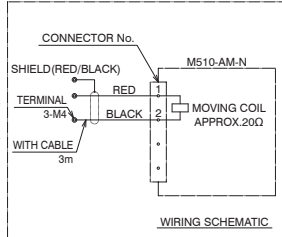
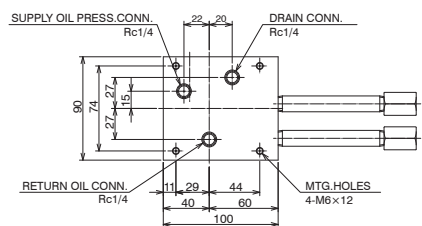


Servoguide MK-IV.M (High-load type) (explosion-proof type solenoid valve and motor) MODEL M721-AM-2 Drawing No. AD6860.0-20E
M721-AM-3

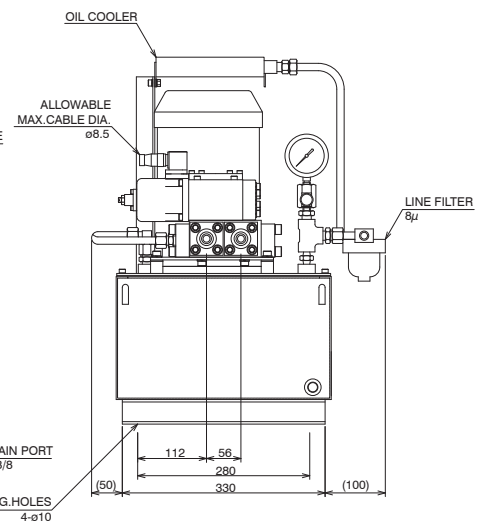
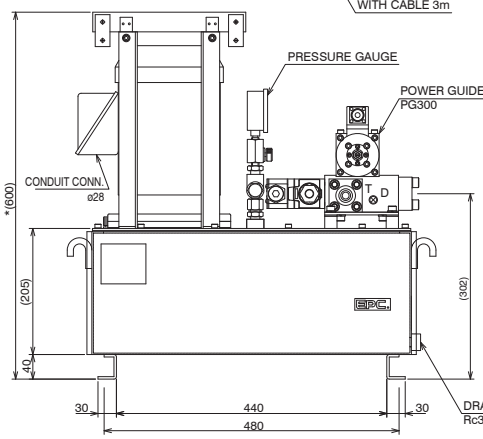
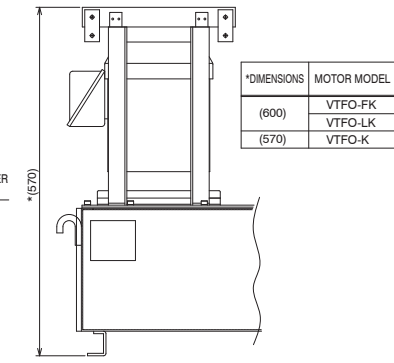
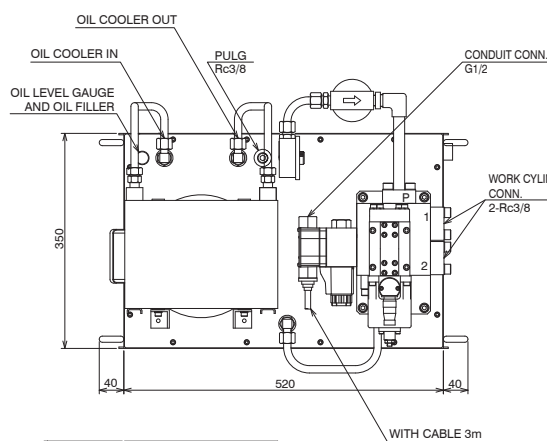


Model	Max. operating pressure (MPa)	Pump capacity (L/min)	Input Signal	Ambient temperature (°C)	Mass (kg)	Installation
M510	5	9.0	-250~0~+250mA DC	-10~40	Approx. 6	Horizontal
AM						
Solenoid power supply voltage	0	200V 50/60Hz, 220V 60Hz				
	1	100V 50/60Hz, 110V 60Hz				
	2	110V 50Hz				
	3	220V 50Hz				
	4	DC24V				
	N	-				
	X	-				

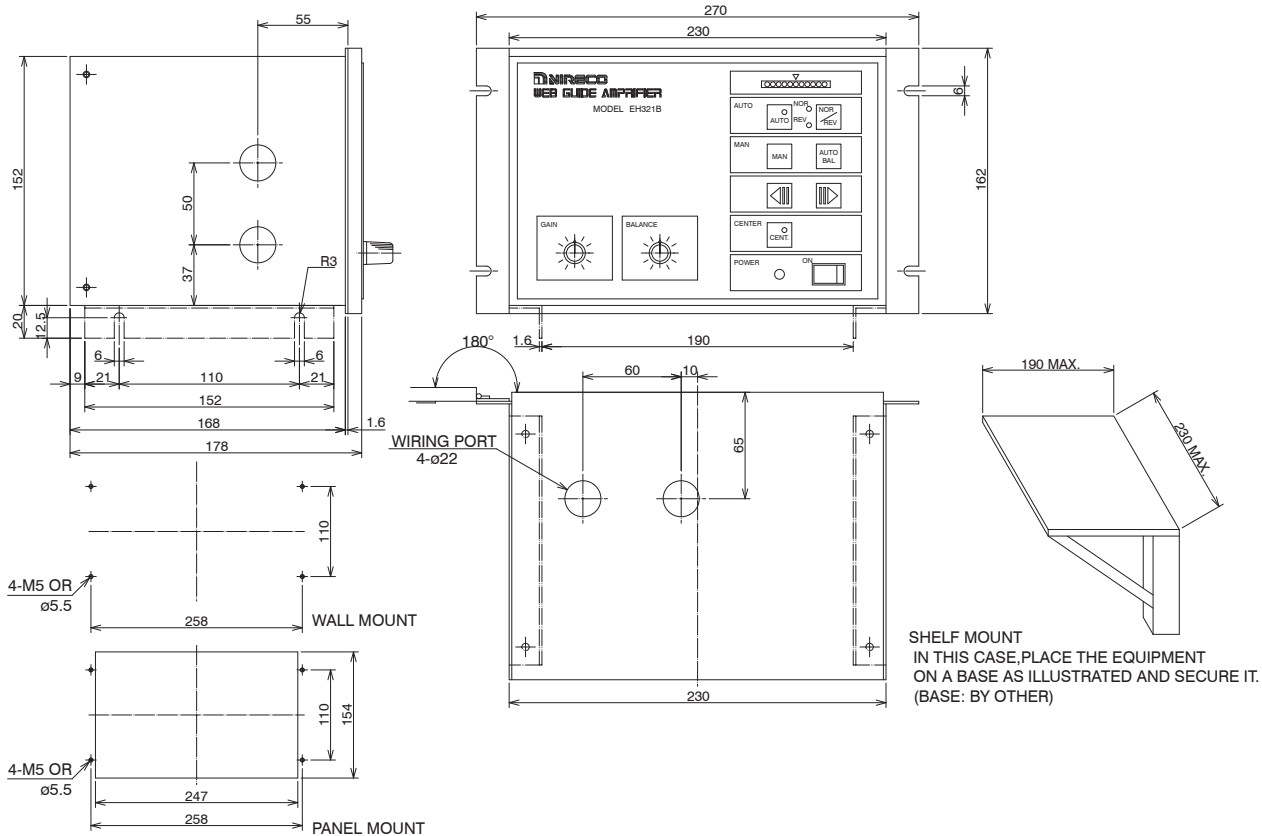
The voltage that is not written in the left assumes it X, and write the voltage.



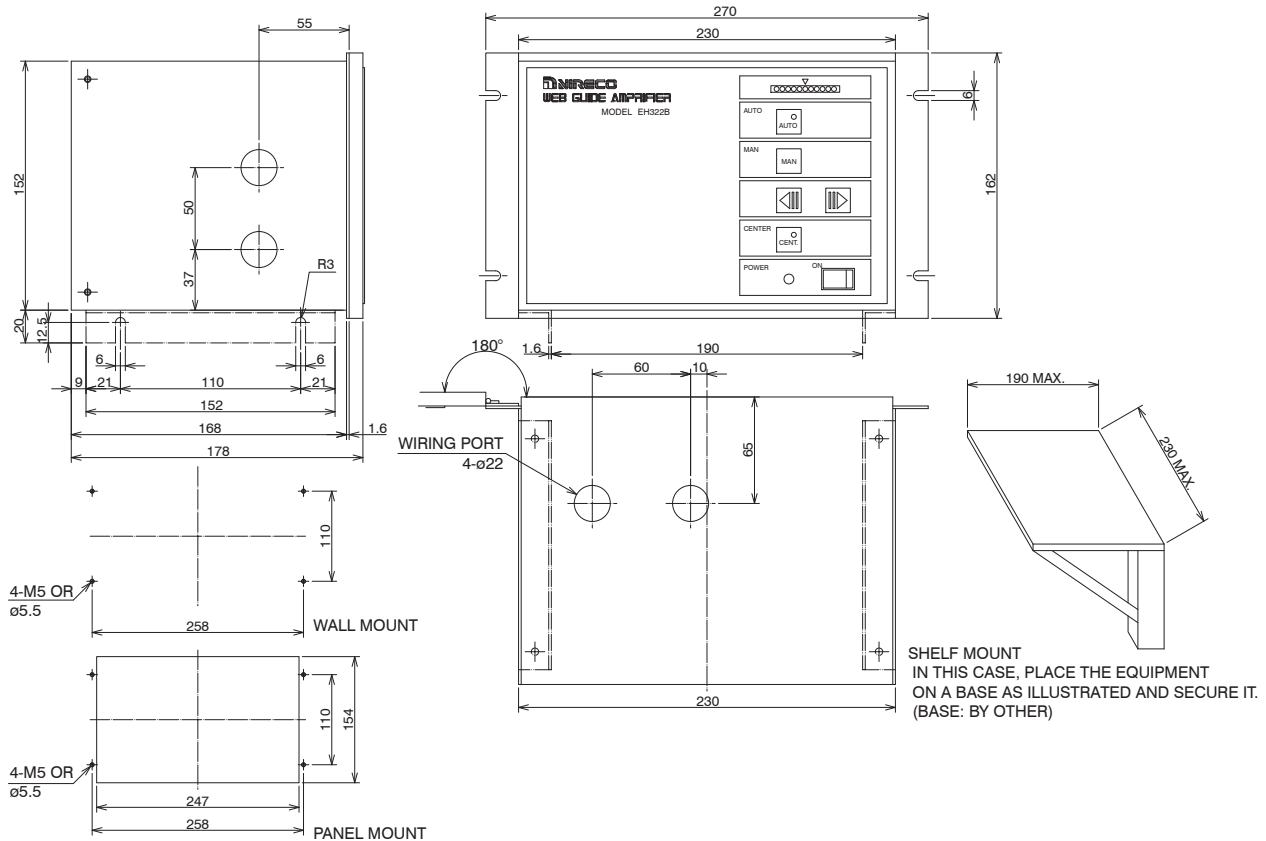
Servoguide MK-IV.M (Controller element) MODEL M510-AM Drawing No. AD6848.0-EA



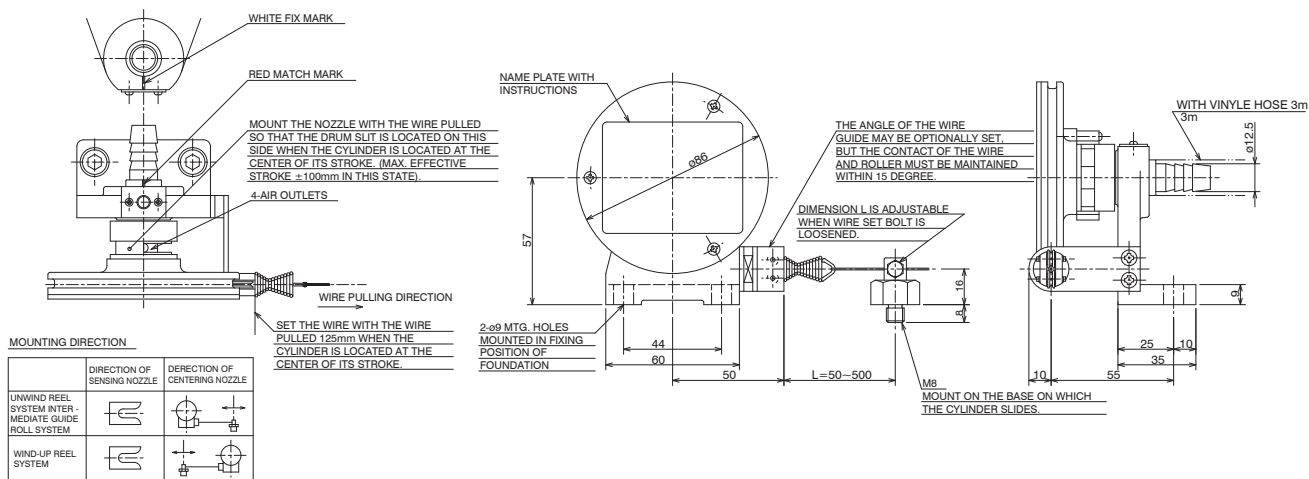
Power Guide Unit (High output/High response type) MODEL M820-AM Drawing No. AD0000140-EA



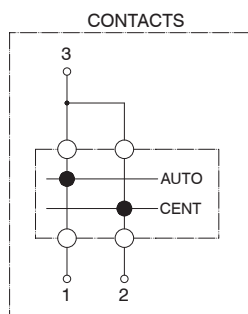
Webguide Amplifier EH321B Drawing No. MK0003270-EA



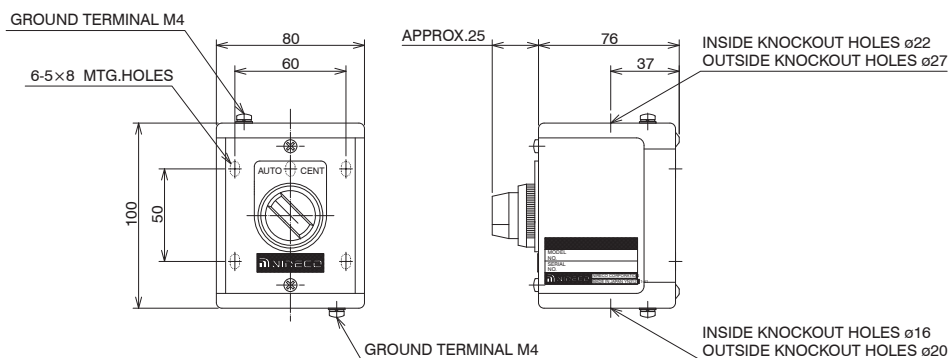
Webguide Amplifier EH322B Drawing No. MK0003280-EA



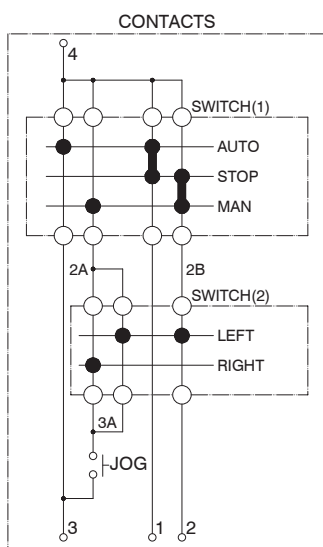
Centering nozzle MODEL CN12 Drawing No. FP3001.2-EA



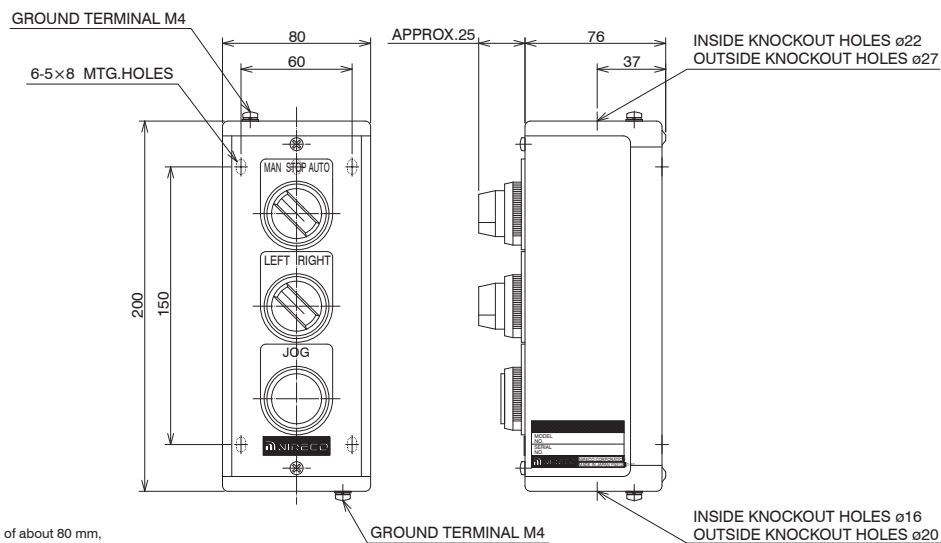
Note: Extend the cables from the switch box for a length of about 80 mm, attach mark tubes and crimp-style terminals individually, and put them back to the switch box.



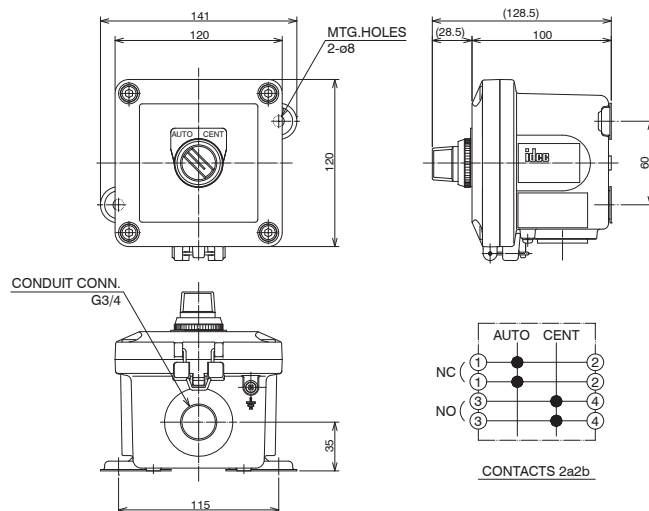
Switch box (for AC) Drawing No. MW8044.1-EA



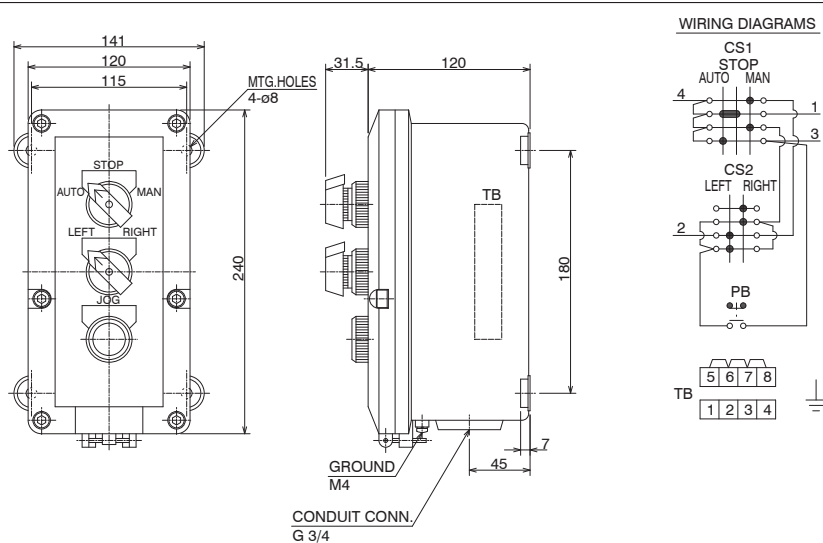
Note: Extend the cables from the switch box for a length of about 80 mm, attach mark tubes and crimp-style terminals individually, and put them back to the switch box.



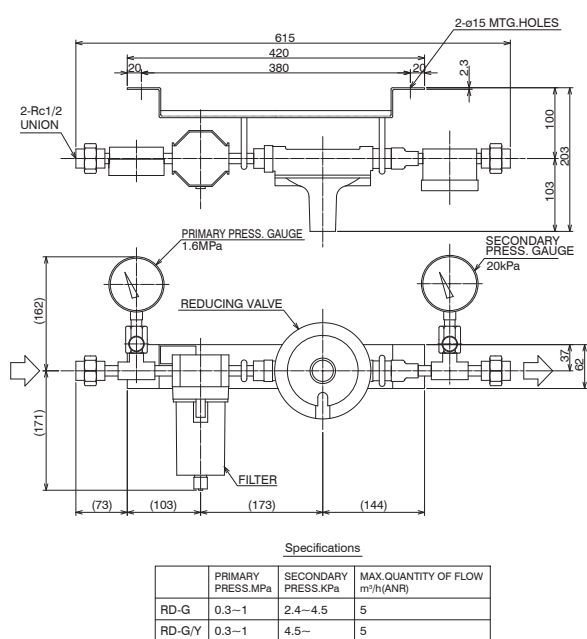
Switch box (for AM) Drawing No. MW8045.1-EA



Pressure-resistant explosion-proof switch box (for AC) Drawing No. MW8017.1-EA



Pressure-resistant explosion-proof switch box (for AM) Drawing No. MW8019.2-EA

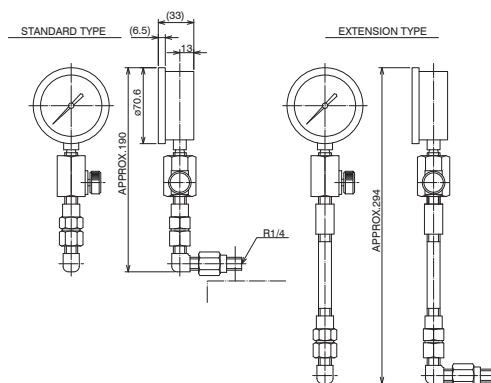


Specifications

	PRIMARY PRESS.MPa	SECONDARY PRESS.KPa	MAX.QUANTITY OF FLOW m ³ /h(ANR)
RD-G	0.3~1	2.4~4.5	5
RD-G/Y	0.3~1	4.5~	5

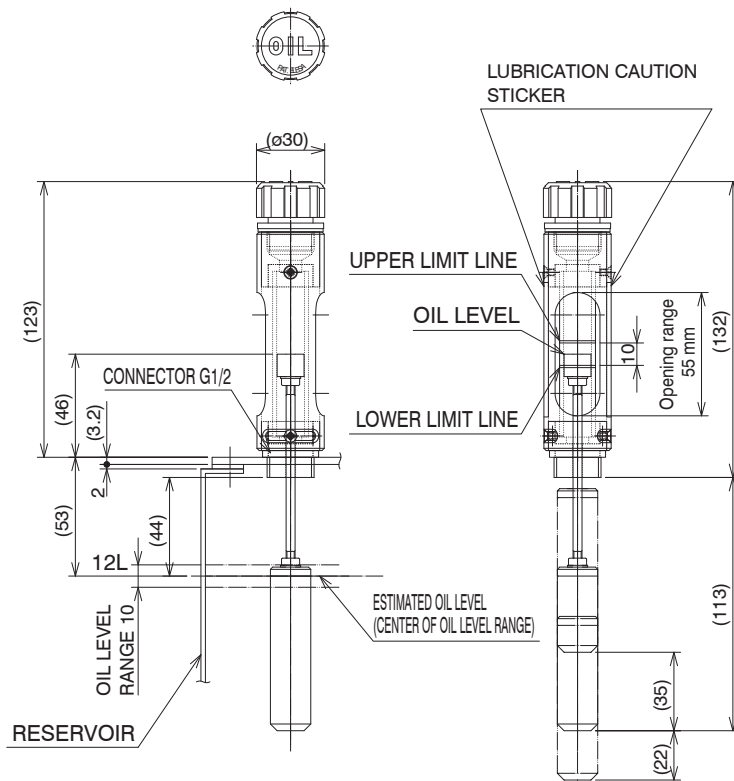
Y: 4.5KPa OR MORE
PLEASE REFER TO 「UC8904.3」

Decompression device RD-G Drawing No. FH9024.1-EA

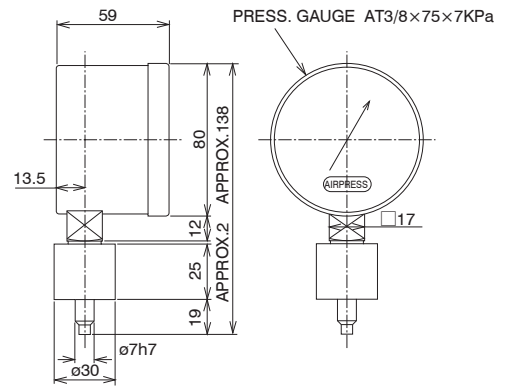


SERVOGUIDE Mk-IV			PRESS.RANGE	PARTS CODE	TYPE
D053B(P) - A -0 D121B(P) AM 1 D226B(P) AMC AC ACS	M121 -AM -0 M220 1	0-3.5MPa	AD6807.0-38-001	STANDARD	
D053B(P) - A -2 D121B(P) AC 3 D226B(P)					
D053B(P) - AM -2 D121B(P) AMC D226B(P) ACS	M121 -AM -2 M220 3	0-3.5MPa	AD6807.0-38-011	EXTENSION	
D721B -A -0 AM 1 AMC 2 AC 3 ACS	M121 -AM -0 M220 1	0-5MPa	AD6807.0-38-002	STANDARD	
	M721 -AM -2	0-5MPa	AD6807.0-38-012	EXTENSION	

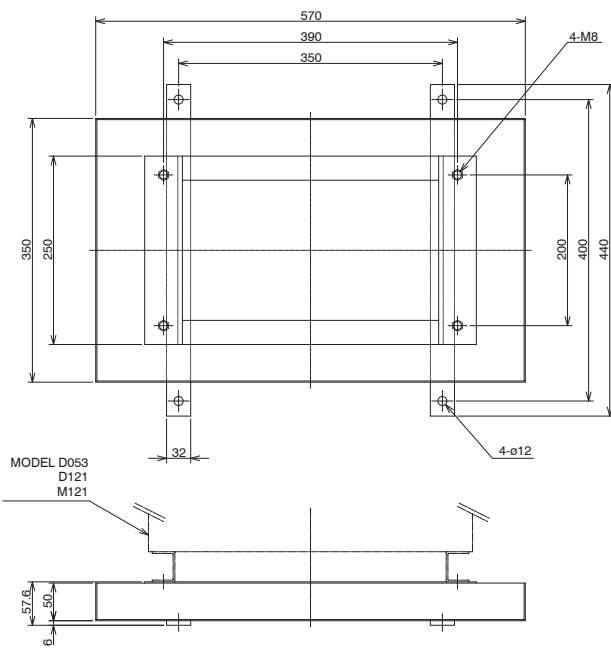
Oil pressure gauge Drawing No. AD6807.0-38P



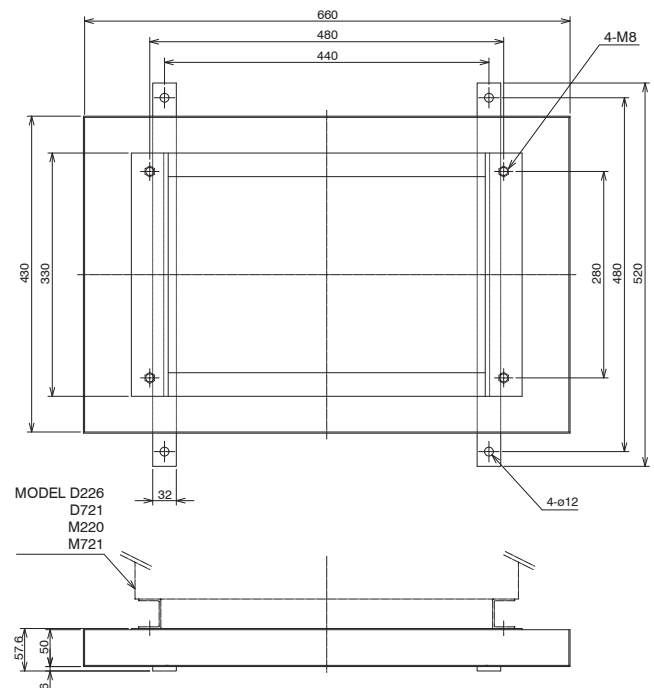
Cap-type oil gauge Drawing No. AD6807.1-55E



Air pressure gauge (for checks) Drawing No. AD6234.0-EA

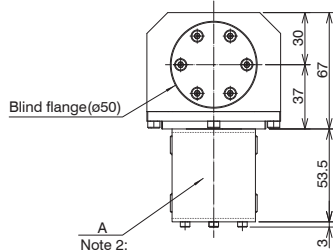
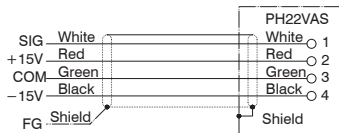


Oil pan: 12 L type (D053, D121, M121) Drawing No. AD6807.0-16E

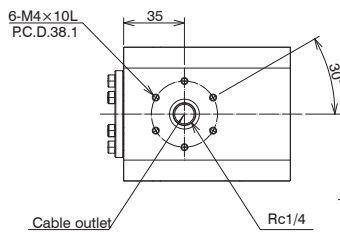


Oil pan: 26 L type (D226, D721, M220, M721) Drawing No. AD6807.0-18E

Wiring diagrams



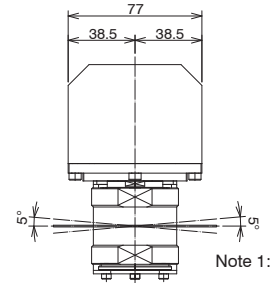
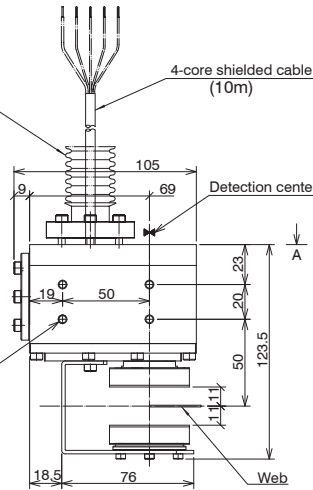
Note 2:



Note 3:
Parts supplied by customer
(recommended parts)
Flange connector NW16

- Flexible tube
NW flange type(NW16)
ORV-16C-cm
(Osaka Rasenkan Kogyo Co., Ltd)
- NW Center ring with outer ring(ISO)
NW16CVH-ISO
(Osaka Rasenkan Kogyo Co., Ltd)
- Bulkhead clamp
NW16-CB
(Advantec Co., Ltd)

For sensor mounting
4-M5×10L
(same for the facing side)



Note 1:

Note 1: For transparent webs or mirror webs,
5° or more tilt.

Note 2: Part A has the model type and
serial number engraved on it.

Note 3: Can be connected with coupling (Rc1/4).

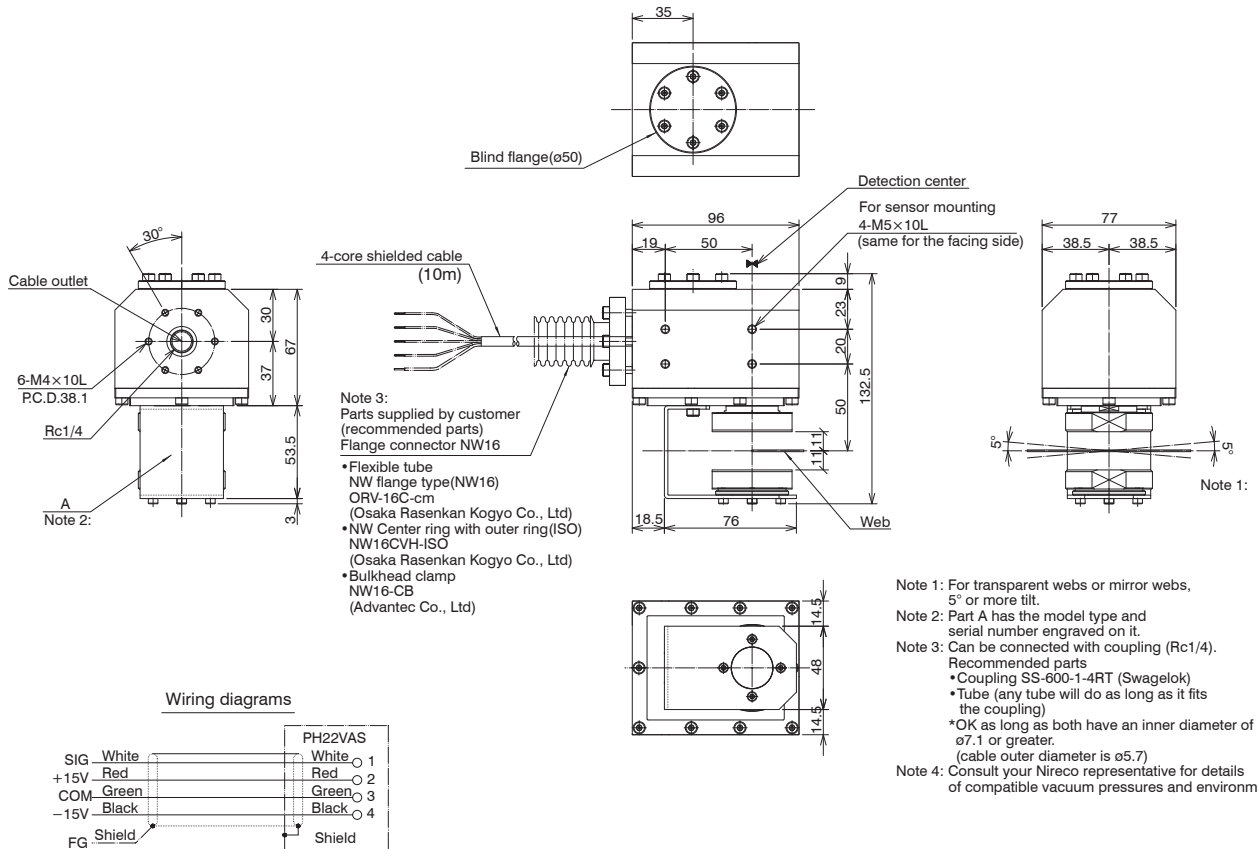
Recommended parts

- Coupling SS-600-1-4RT (Swagelok)
- Tube (any tube will do as long as it fits
the coupling)

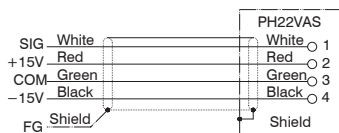
*OK as long as both have an inner diameter of
ø7.1 or greater.
(cable outer diameter is ø5.7)

Note 4: Consult your Nireco representative
for details of compatible vacuum pressures
and environments.

Photohead PH22VAS-T (Vacuum environment compatible) (cable exit to the top) Drawing No. MD0003040-EA



Wiring diagrams



Note 3:
Parts supplied by customer
(recommended parts)
Flange connector NW16

- Flexible tube
NW flange type(NW16)
ORV-16C-cm
(Osaka Rasenkan Kogyo Co., Ltd)
- NW Center ring with outer ring(ISO)
NW16CVH-ISO
(Osaka Rasenkan Kogyo Co., Ltd)
- Bulkhead clamp
NW16-CB
(Advantec Co., Ltd)

Note 1: For transparent webs or mirror webs,
5° or more tilt.

Note 2: Part A has the model type and
serial number engraved on it.

Note 3: Can be connected with coupling (Rc1/4).

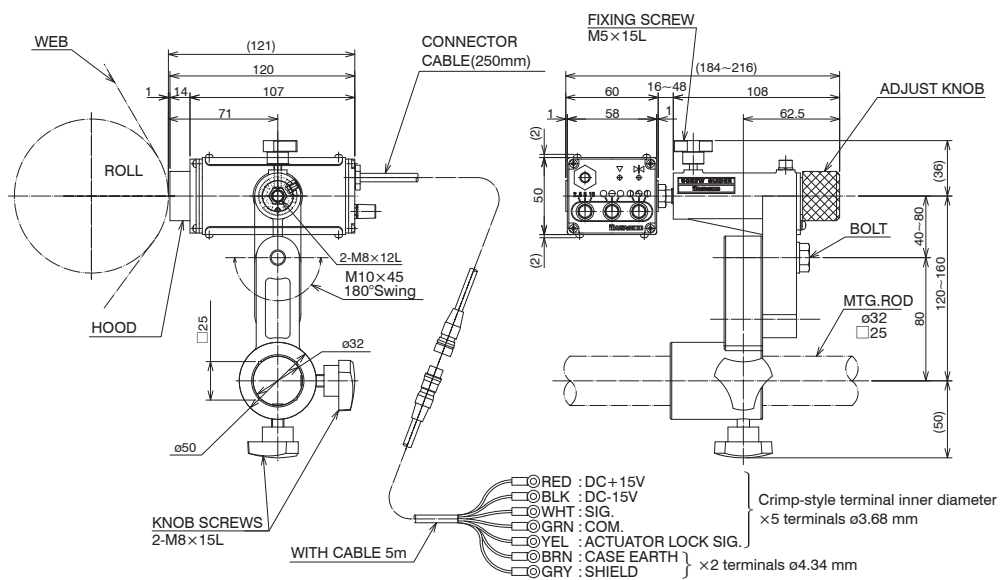
Recommended parts

- Coupling SS-600-1-4RT (Swagelok)
- Tube (any tube will do as long as it fits
the coupling)

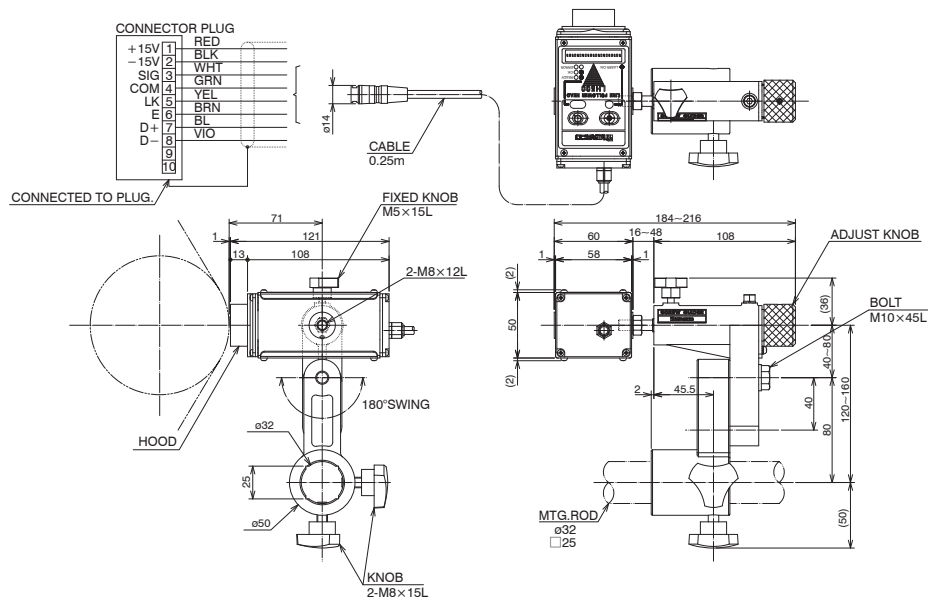
*OK as long as both have an inner diameter of
ø7.1 or greater.
(cable outer diameter is ø5.7)

Note 4: Consult your Nireco representative
for details of compatible vacuum pressures
and environments.

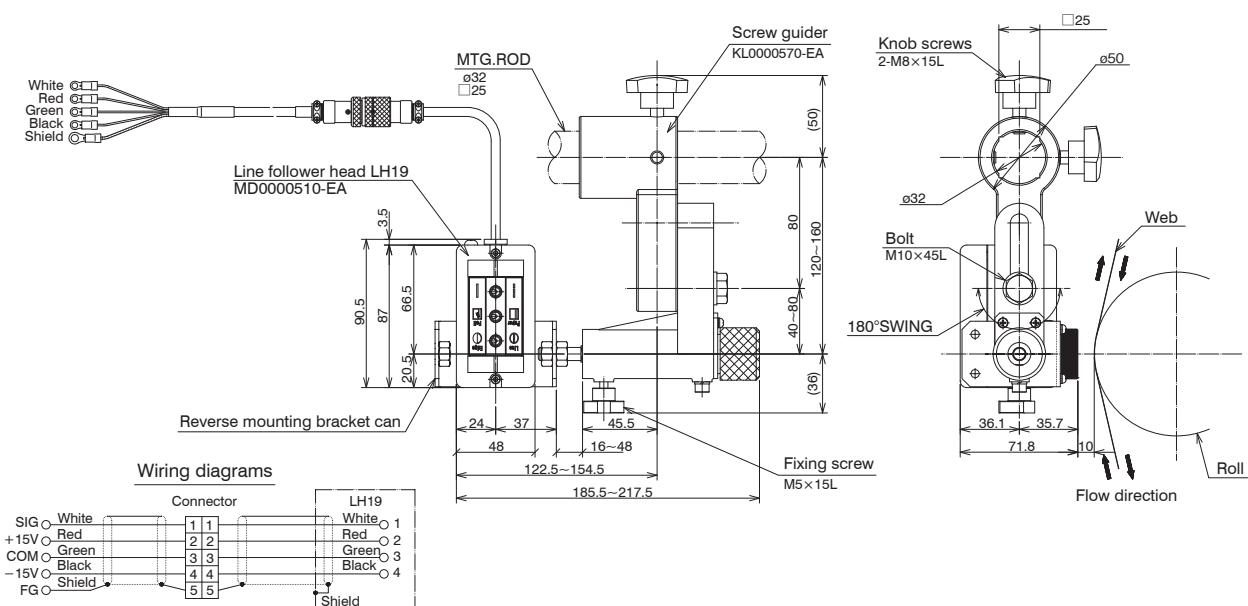
Photohead PH22VAS-R (Vacuum environment compatible) (cable exit to the back) Drawing No. MD0003080-EA



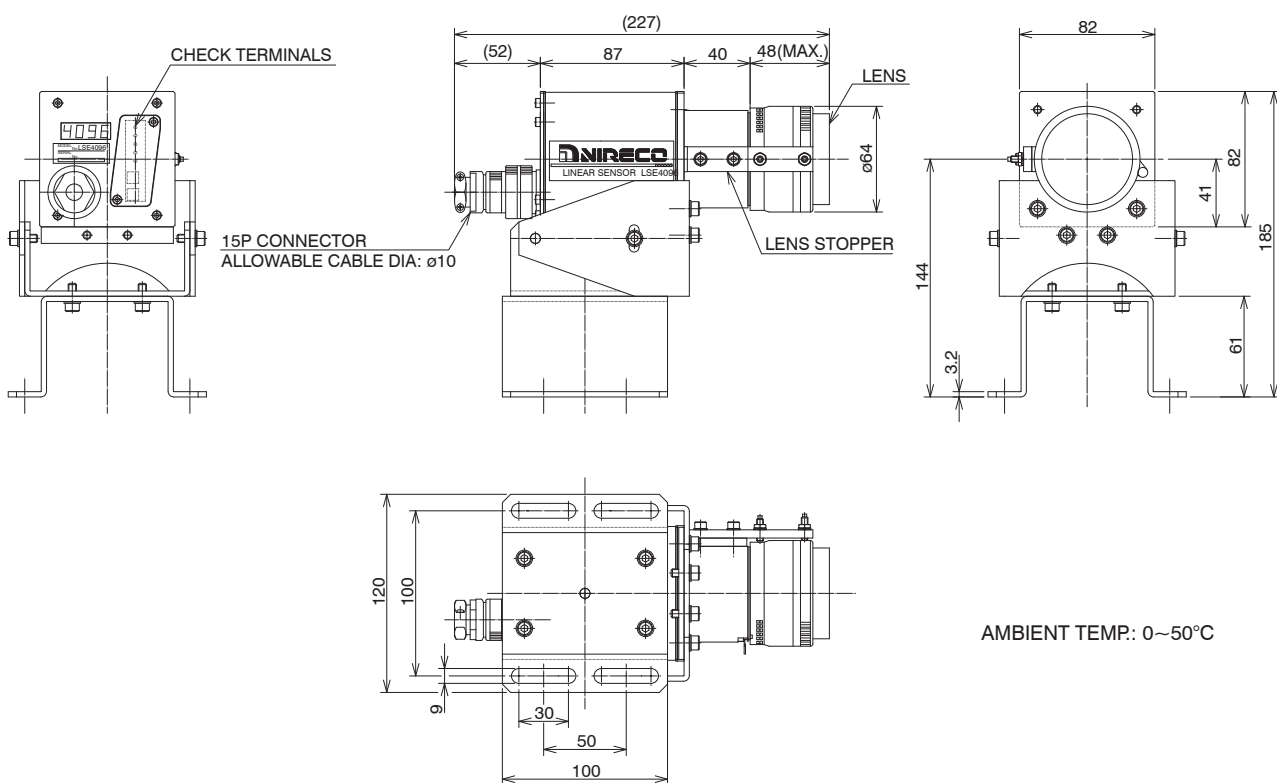
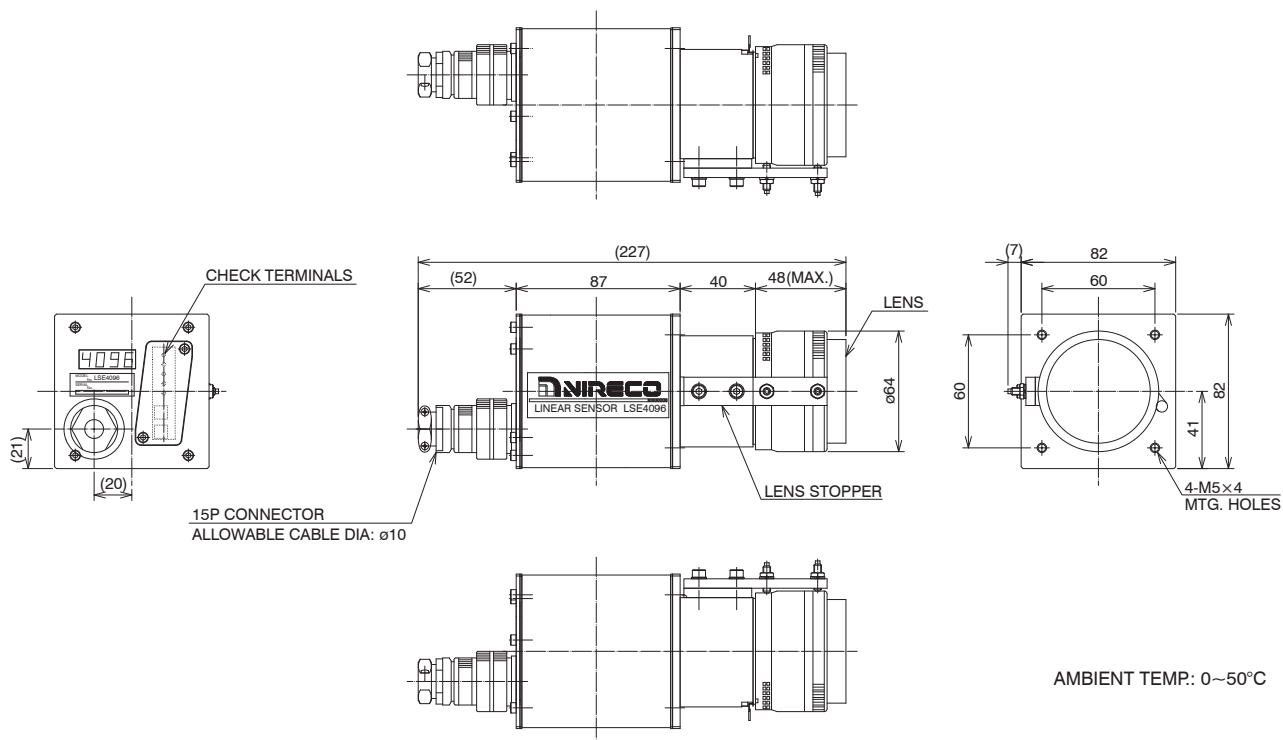
Line Follower Head LH110 (with screw guider) Drawing No. KL0000720-EA

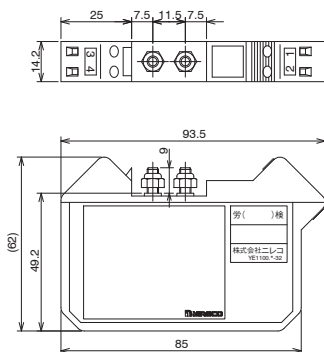


Line Follower Head LH500 (with screw guider) Drawing No. KL0001170-EA



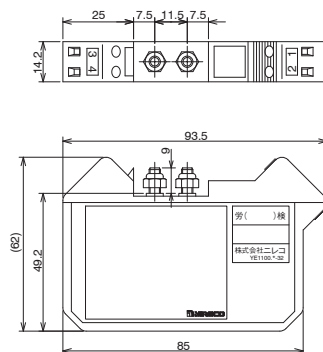
Line Follower Head LH19 (with screw guider) Drawing No. KL0000740-EA





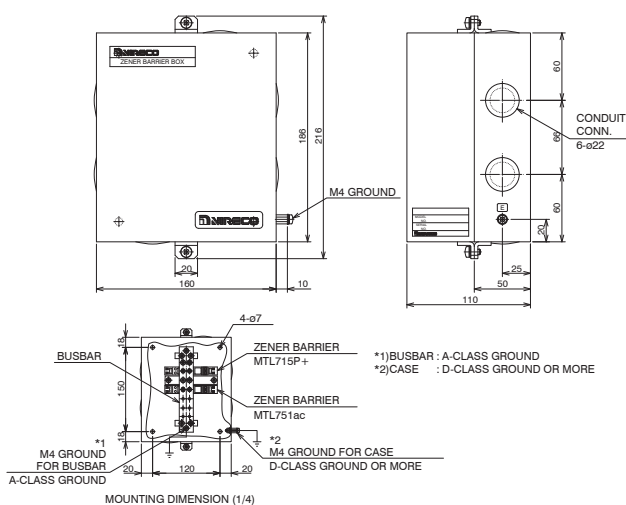
Model : MTL715P+
 Manufacturer : MTL Instruments KK
 Rating : $U_o = 15V$
 $I_o = 291.5mA$
 $P_o = 1.093W$
 $U_m = 250VAC\ 50/60Hz, 250VDC$
 $C_o = 0.75\mu F$
 $L_o = 0.32mH$
 $T = 60^\circ C$

Zener Barrier MTL715P+ Drawing No. MD0330.0-EA

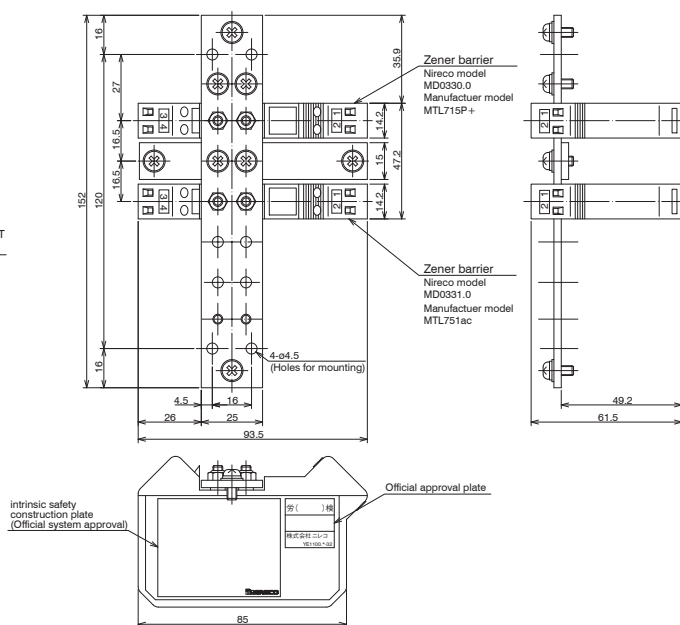


Model : MTL751ac
 Manufacturer : MTL Instruments KK
 Rating : $U_o = 2V$
 $I_o = 200mA$
 $P_o = 0.05W$
 $U_m = 250VAC\ 50/60Hz, 250VDC$
 $C_o = 40\mu F$
 $L_o = 0.125mH$
 $T = 60^\circ C$

Zener Barrier MTL751ac Drawing No. MD0331.0-EA

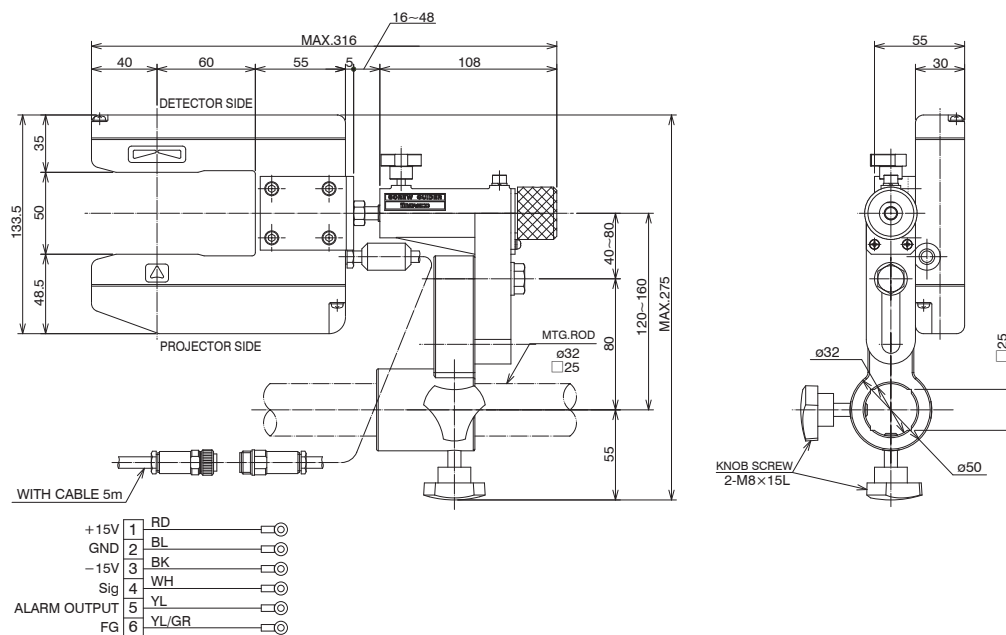


Zener barrier box intrinsic safety construction Ultrasonic Sensor Drawing No. MW9013.0-EA

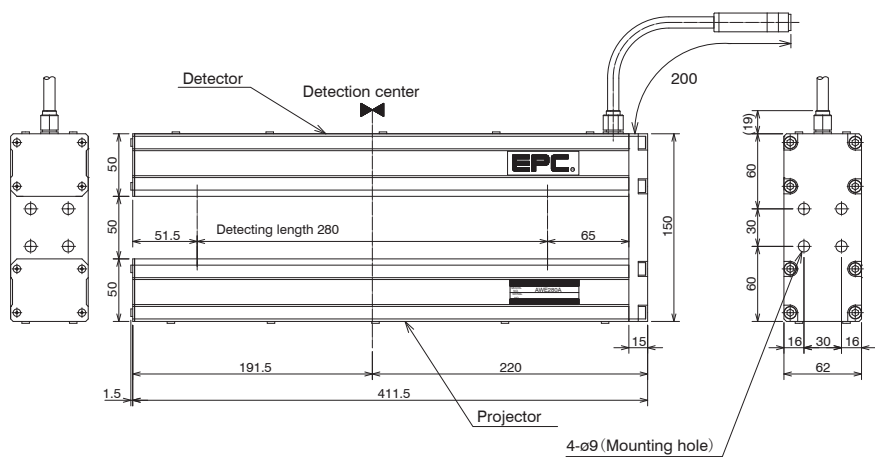
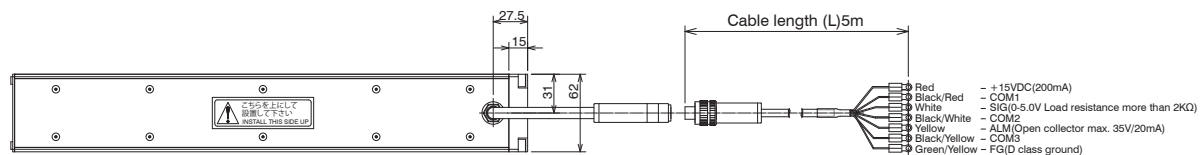


Zener barrier assembly for intrinsic safety construction Ultrasonic Sensor Drawing No. MW9013.0-02P

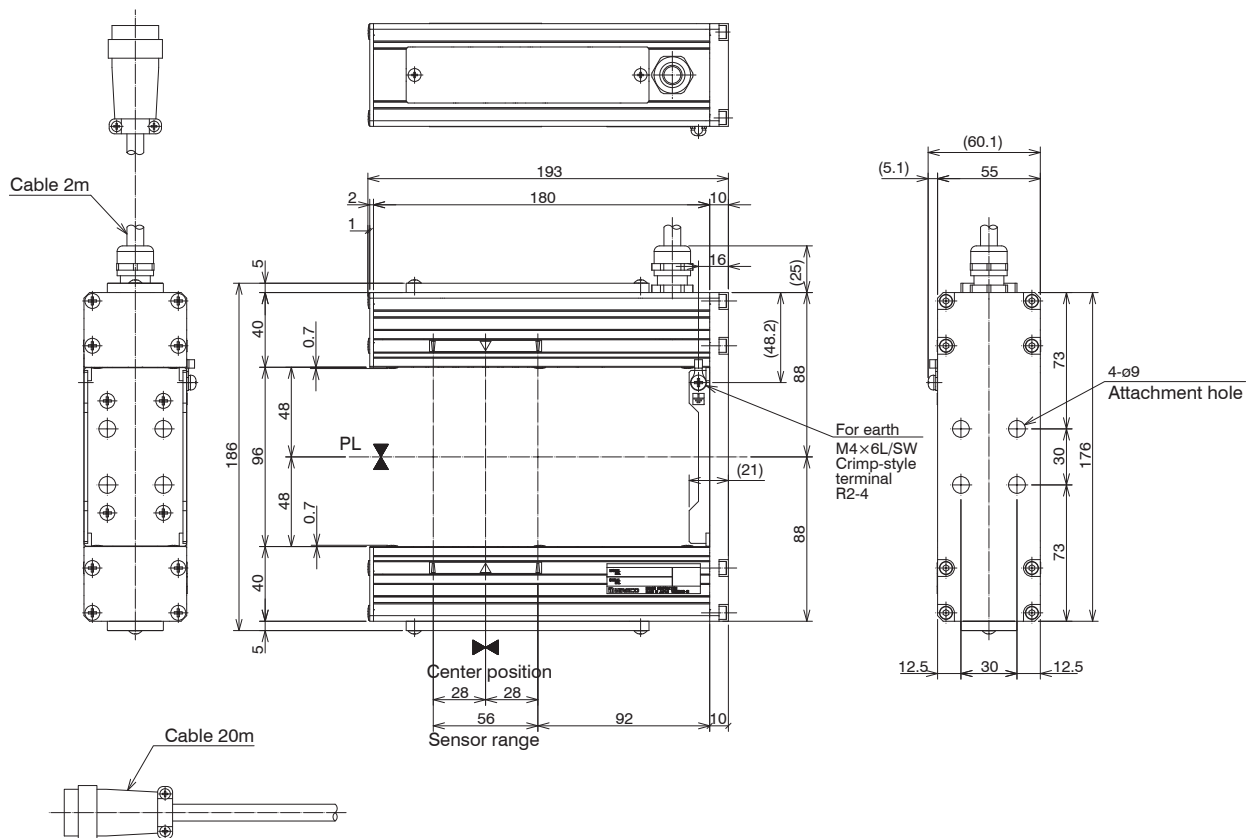
Zener barrier external dimensions



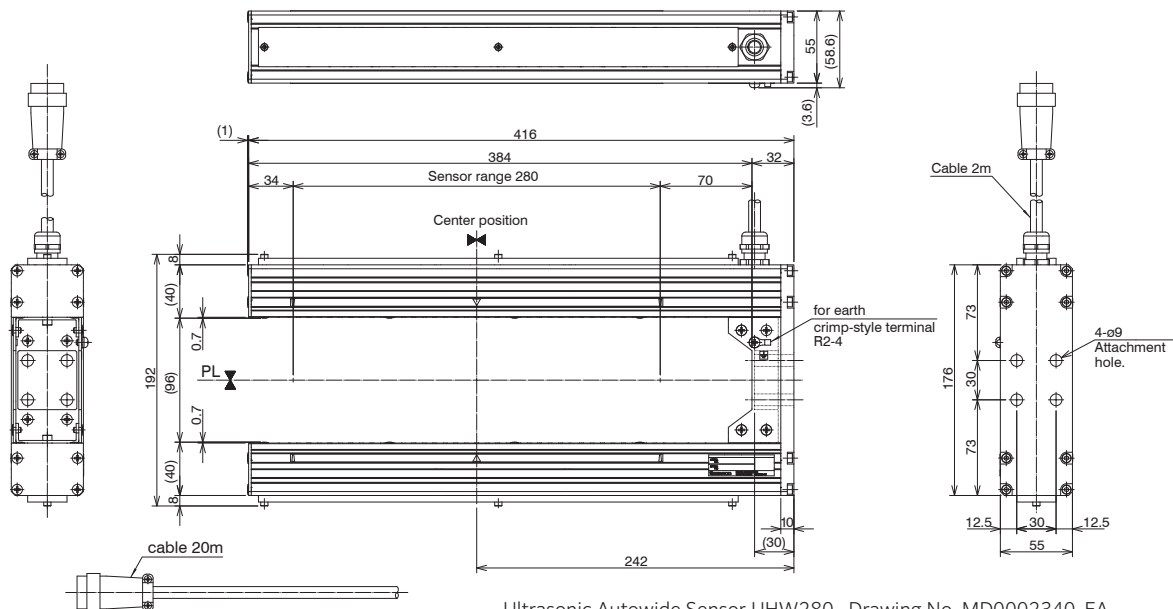
CMOS Linear Sensor SLH30 (with screw guider) Drawing No. KL0001500-EA



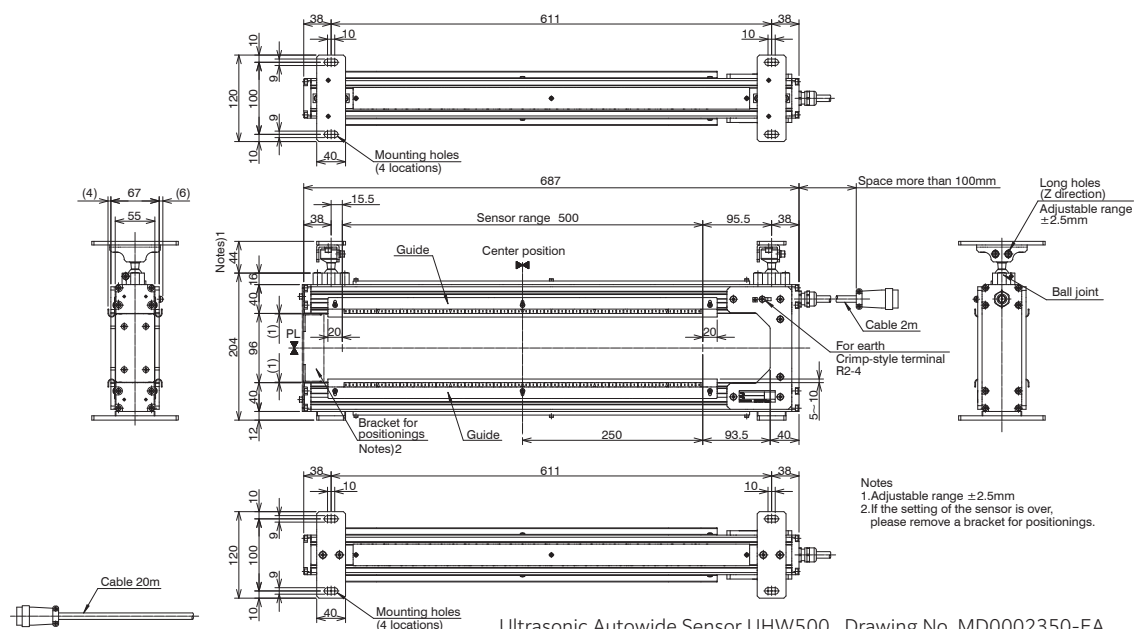
Autowide Sensor AWE280A Drawing No. MD0003800-EA



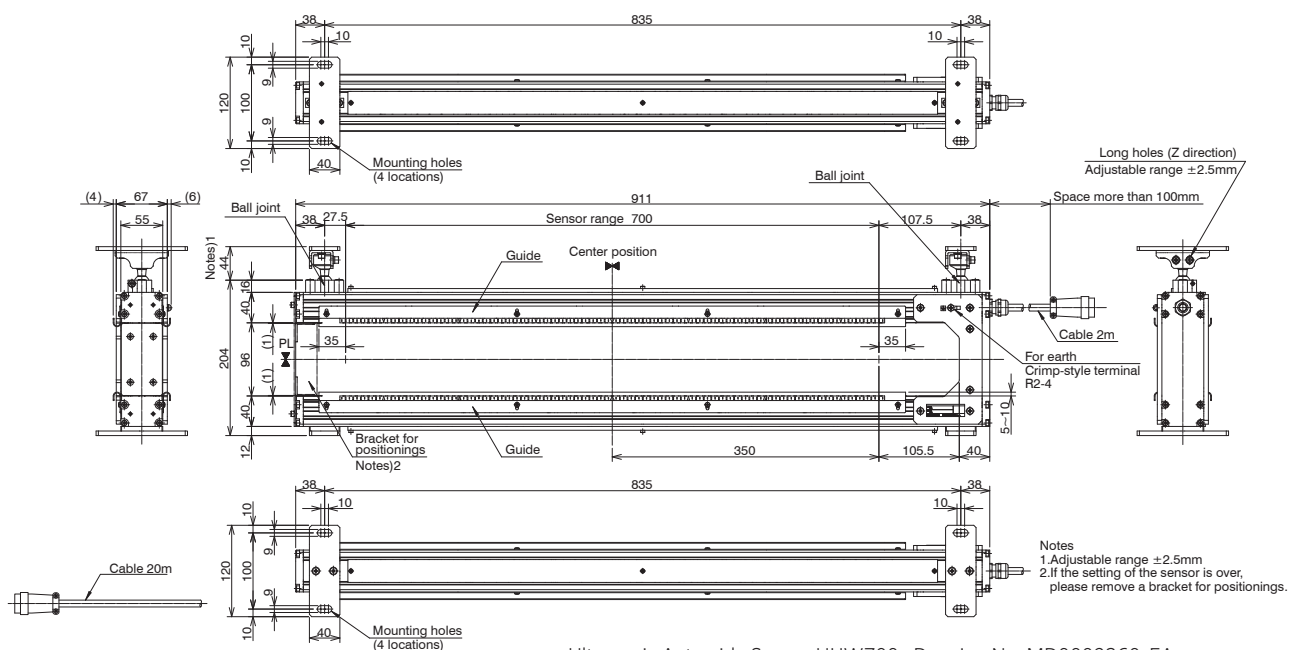
Ultrasonic Autowide Sensor UHW051 Drawing No. MD0002560-EA



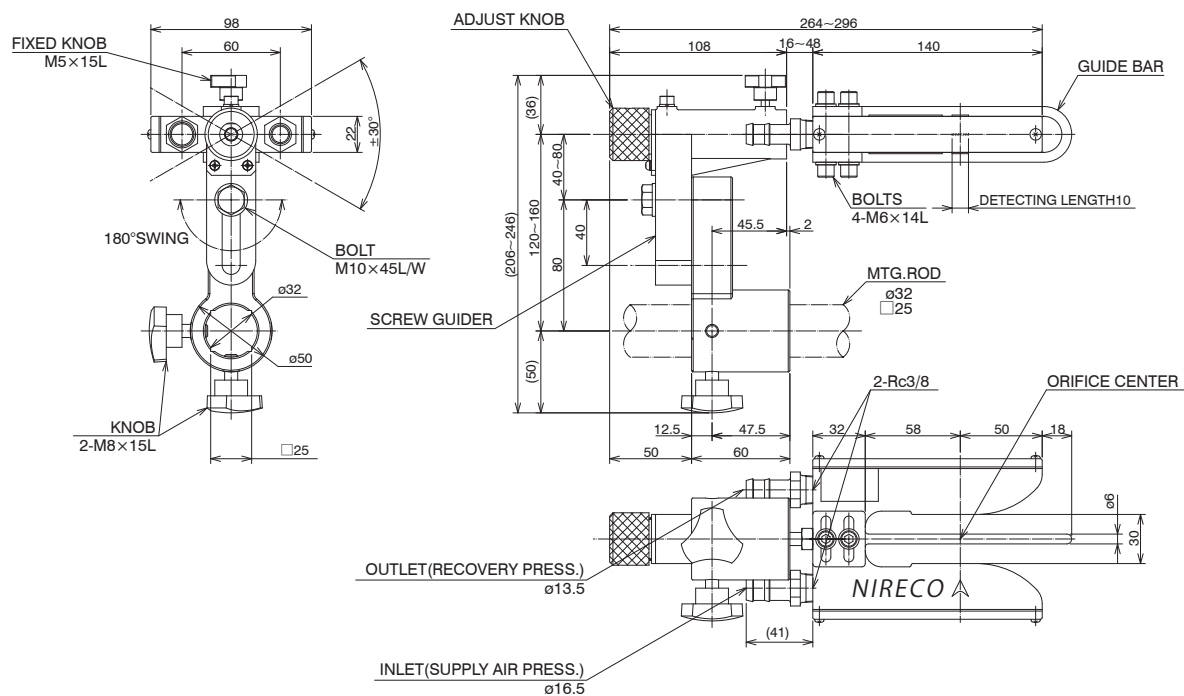
Ultrasonic Autowide Sensor UHW280 Drawing No. MD0002340-EA



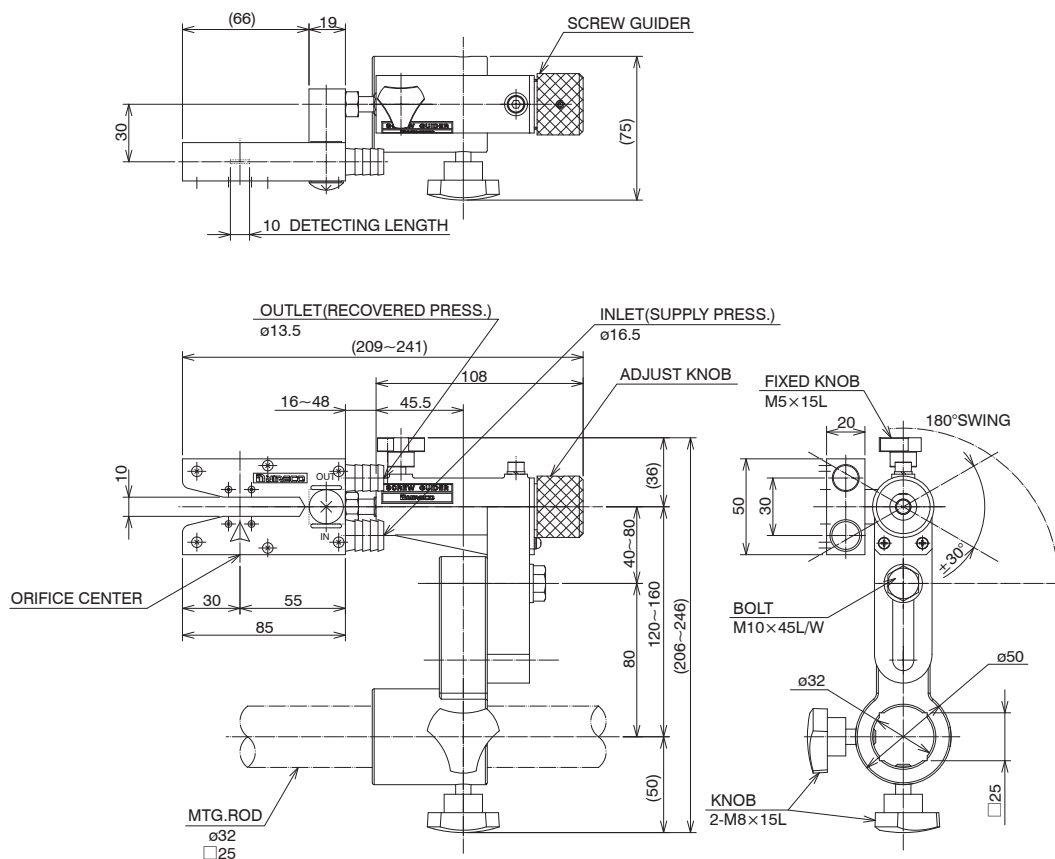
Ultrasonic Autowide Sensor UHW500 Drawing No. MD0002350-EA



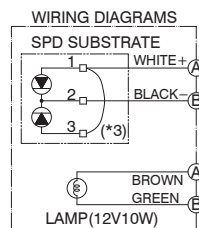
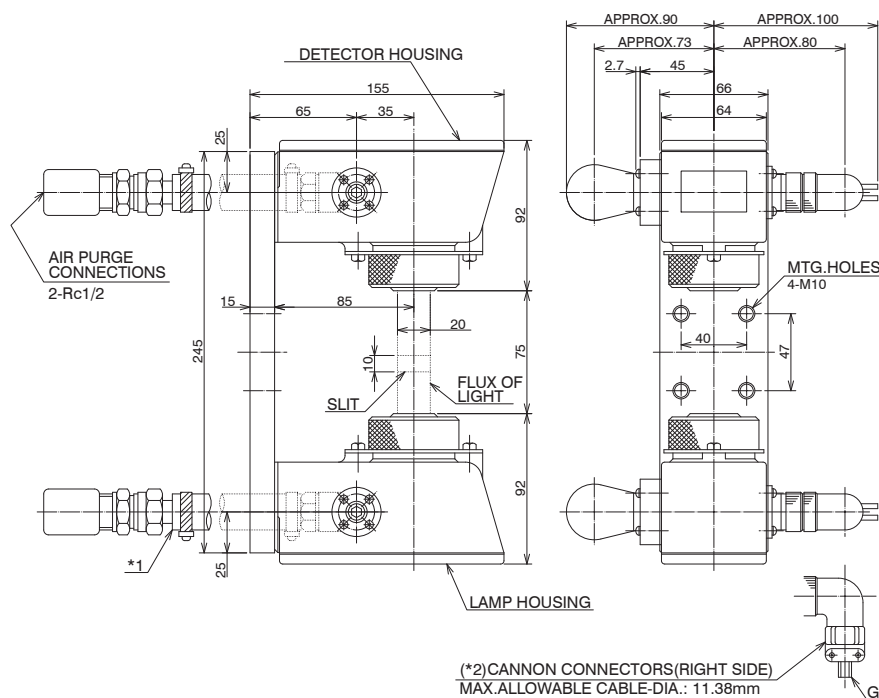
Ultrasonic Autowide Sensor UHW700 Drawing No. MD0002360-EA



Sensing nozzle SN12G (with screw guider) Drawing No. KL0001190-EA



Sensing nozzle SN15 (with screw guider) Drawing No. KL0001110-EA

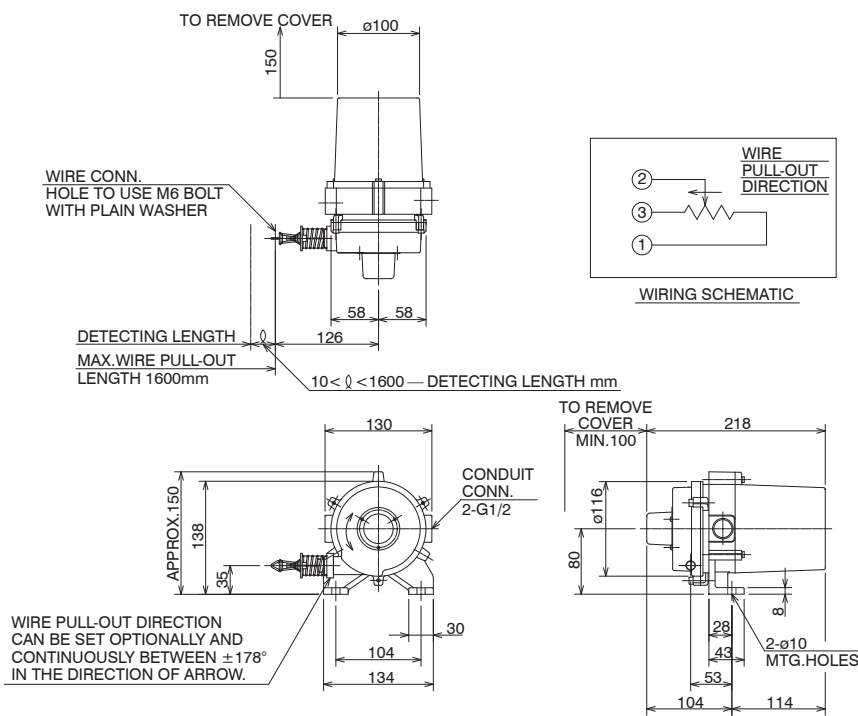


NOTES

1. WITH COPPER WIRE OF 2mm² USED, TOTAL WIRING LENGTH COVERING BOTH WAYS BETWEEN LAMP HOUSING AND AMPLIFIER MUST NOT EXCEED 400 METERS (WIRING RESISTANCE MUST BE LESS THEN 4 OHMS).
2. MOUNT DETECTOR HOUSING ON UPPER SIDE.
3. (*1) WITH NO AIR PURGE ARRANGED REQUIRING NO FLEXIBLE HOSE ACCORDINGLY, PROVIDE BLIND PLUG AT CONNECTION PORT.
4. (*2) WITHOUT OTHERWISE SPECIFIED, CANNON CONNECTOR IS MOUNTED ON THE RIGHT SIDE.
5. (*3) MAKE SURE OF 1-3 JUMPER.

AIR PURGE SUPPLY PRESS.	50 kPa
FLOW AMOUNT	400 L/min

Photohead PH30N (No air purge) Drawing No. MD0134.1-EA
PH30P (with air purge)



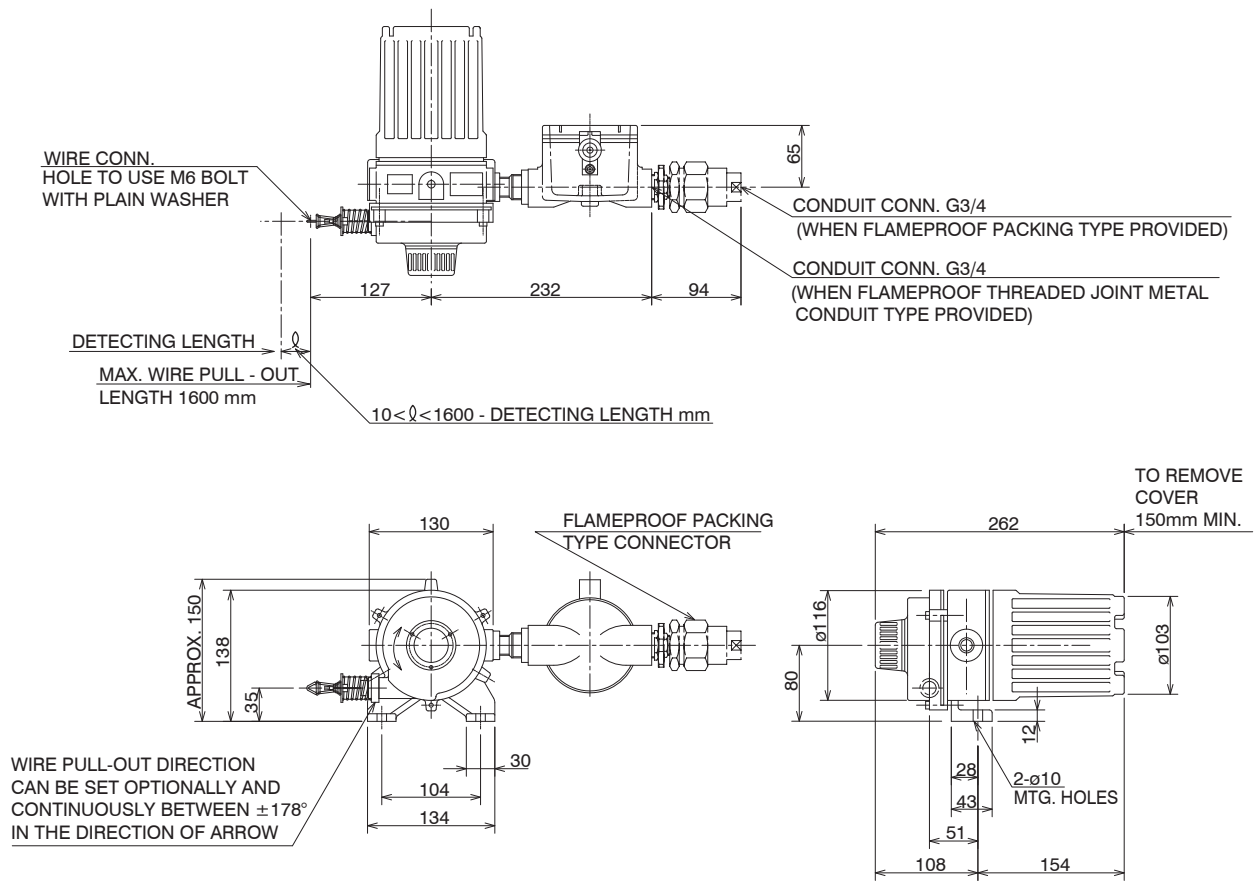
MODEL : FW22. □

CODE	MAX. DETECTING LENGTH	POTENTIO METER
01	270 mm	STANDARD TYPE
02	840 mm	
03	1405 mm	
11	270 mm	OIL SEAL TYPE
12	840 mm	
13	1405 mm	
21	270 mm	HIGH LINEARITY TYPE
31	270 mm	HIGH TEMPERATURE TYPE
32	840 mm	
33	1405 mm	

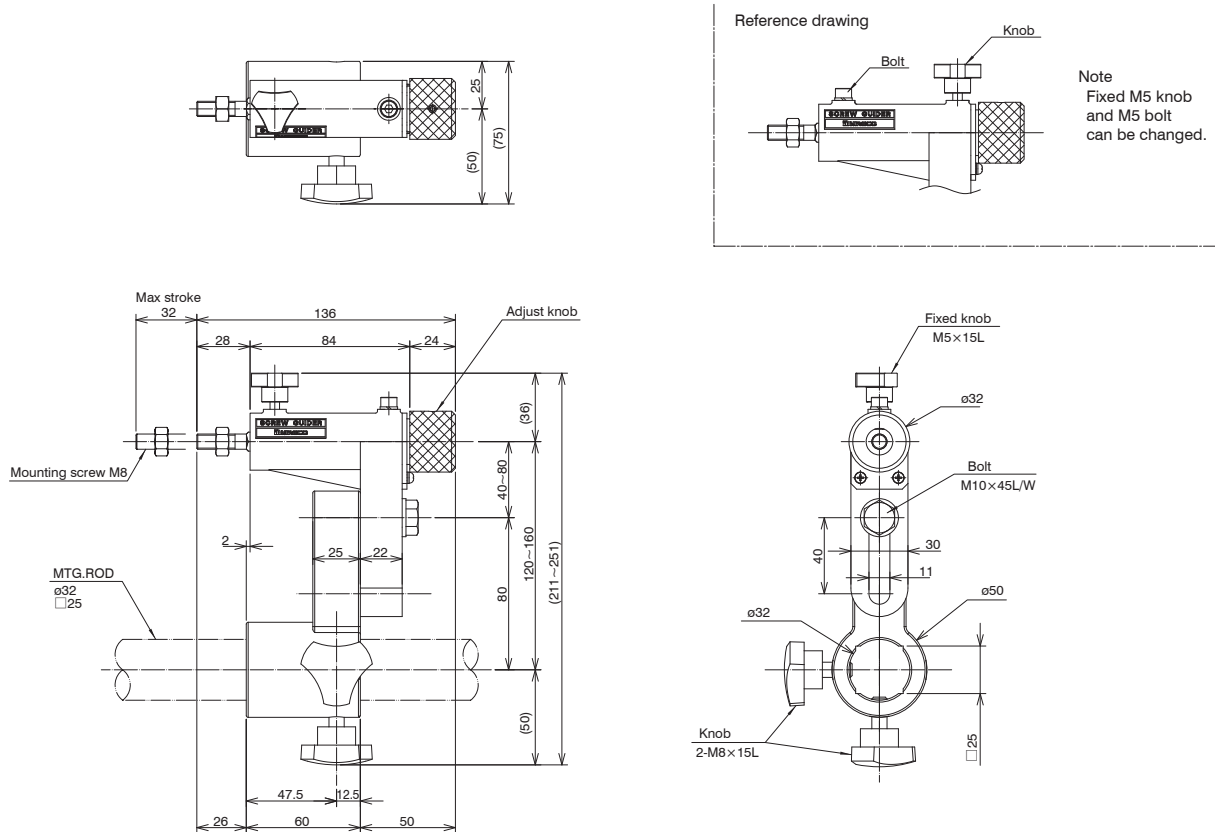
AMBIENT TEMP.

WITHOUT HIGH TEMP. TYPE : -20~60°C
HIGH TEMP. TYPE : -20~80°C
INDOOR SETTING

Analogue position transmitter wire position sensor FW22 Drawing No. MW1110.0-EA



Analog position transmitter wire position sensor FW31 Drawing No. MW1102.2-EA



Screw Guider Drawing No. KL0000570-EA

WEB GUIDE CONTROL SYSTEMS

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