PNEUMATIC GRIPPER

HI-ROTOR-DRIVEN PNEUMATIC GRIPPER
CYLINDER-DRIVEN PNEUMATIC GRIPPER

TÜV CERT
DIN EN ISO 9001
JIS Z 9901
Certificate: 09 100 5769

Parker KURODA

ENGINEERING YOUR SUCCESS.

CYLINDER-DRIVEN

PNEUMATIC GRIPPER

Switches available as attachment

Can be equipped with 2 switches to check opening and closing of the finger.
The switch is fitted into the groove provided on the side of the gripper body.

Gripper body can be installed to turn to any of 3 directions.

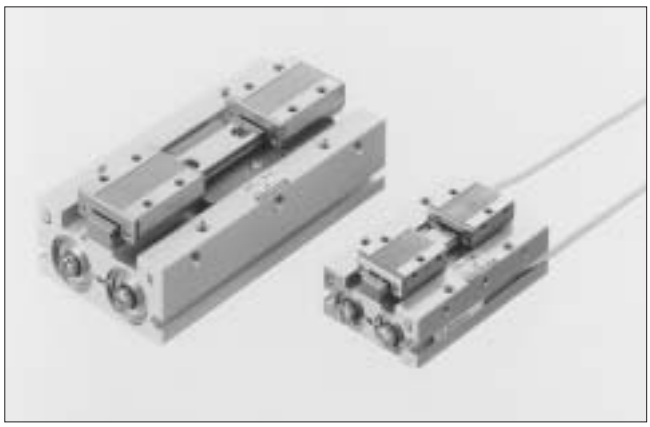
Set-screws or through-holes are provided on 3 sides of the body.

Optional adaptor

Optional adaptors for GPCR, GPCL, GVC and GVH Series are available.

Extremely thin prallel gripper with linear guide

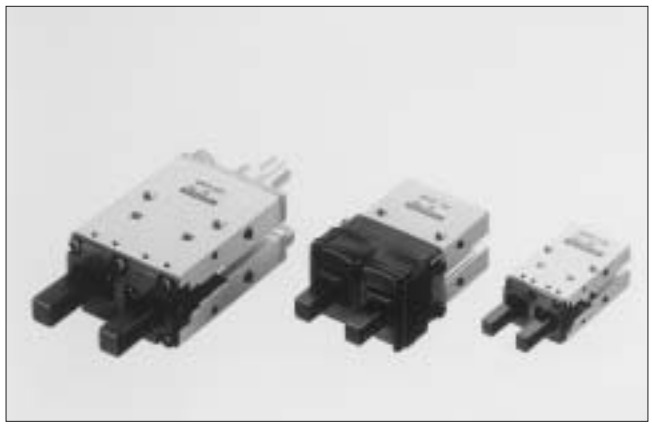
GPDL Series



- **Extremely thin body**
  Making the cylinder horizontal has realized the lightweight and extremely thin body.
- **High degree of gripping accuracy and rigidity**
  Use of a linear guide in the finger results in high degree of gripping accuracy and rigidity.
- **High gripping force**
  High gripping force owing to a double piston system.
- **Adjustable stroke**
  Adjustable stroke in both opening and closing directions.

Parallel gripper with cross roller

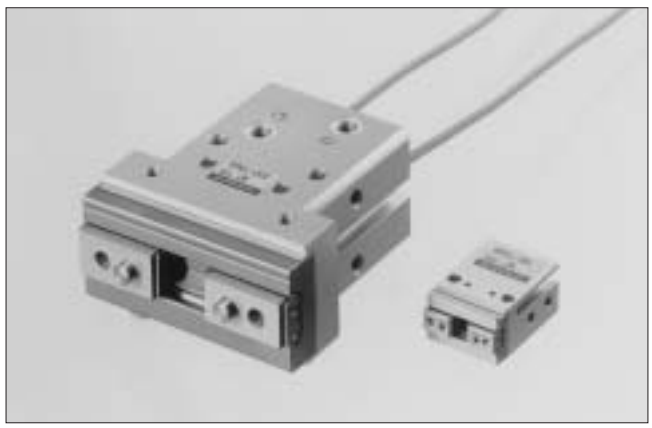
GPCR Series



- **High degree of gripping accuracy and rigidity**
  Use of a cross roller guide in the finger has realized long service life, high degree of gripping accuracy (±0.01mm or less) and high rigidity.
- **Dustproof cover**
  Optionally available

Parallel gripper with linear guide

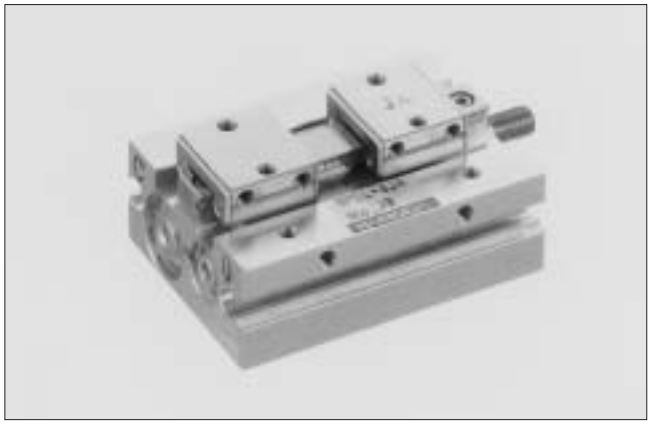
GPCL Series



- **High degree of gripping accuracy and rigidity**
  Use of a linear guide in the finger has realized long service life, high degree of gripping accuracy and high rigidity.
- **High degree of repeatability : ±0.01mm or less**
- **High degree of centering accuracy : ±0.07mm or less**

Asynchronous type parallel gripper with linear guide

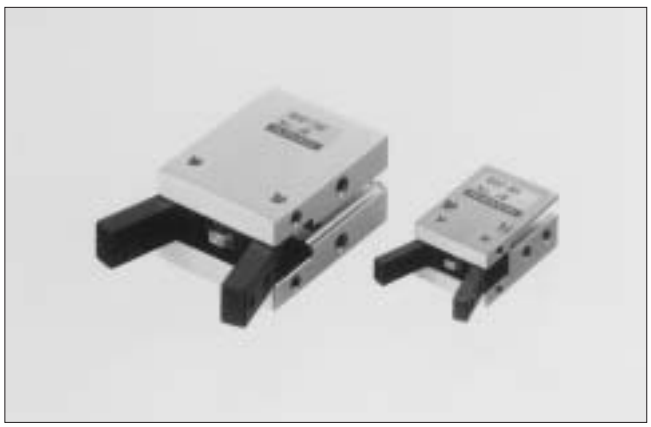
GPEL Series



- **Asynchronous type**
  Asynchronous type designed to grip work based on the stop position of the single side finger.
- **Finely adjustable stop position**
  The stop position of the single side finger can be easily adjusted with a screw.
- **High degree of gripping accuracy and rigidity**
  Use of a linear guide in the finger has realized high degree of gripping accuracy and high rigdity.
- **Extremely thin body**
  Making the cylinder horizontal has realized the lightweight and extremely thin body.
- **High gripping force**
  High gripping force owing to a double piston system.
- **Repeatability : ±0.01mm**
- **Centering accuracy**
  Adjustable to zero.

Rotating gripper

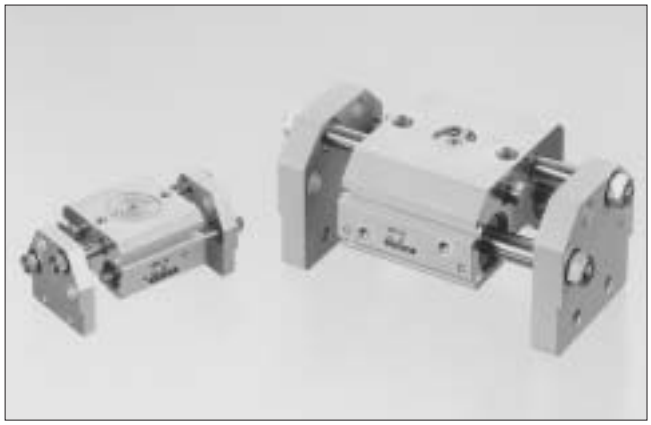
GVC Series



- **Long life**
  The finger is made of chromium molybdenum steel and main part is hardened, assuring long service life.

Crab type parallel gripper

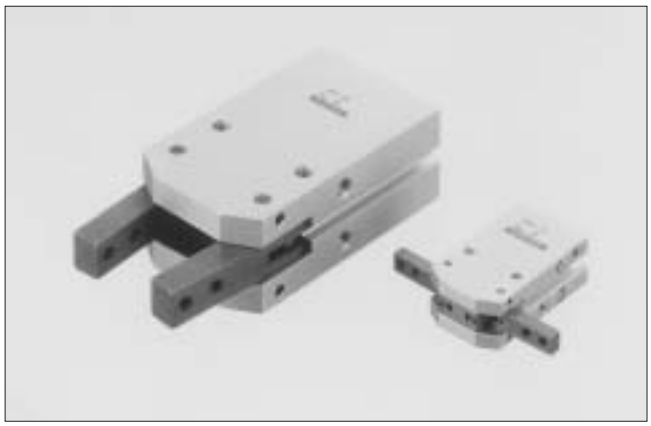
GPK Series



- **Long stroke**
  Long gripping stroke (twice as much as cylinder diameter), lightweight and compact body.
- **High gripping force and high rigidity**
  High gripping force owing to a double piston system.

Rotating gripper with 180° finger opening angle

GVH Series



- **Finger opening angle of 180°**
  As the finger opens 180° in a straight line to eliminate interference between work and finger, making lateral movement possible.
- **High gripping force and high degree of gripping accuracy**
  A link mechanism is provided to attain high gripping force (when fingers are in parallel) and high degree of gripping accuracy.

FOR SAFETY USE

Be sure to read the following instructions before use.
For common and individual instructions, refer to the text of this catalogue.

The following safety precautions are provided to prevent damage and danger to personnel and to provide instructions on the correct usage of this product. These precautions are classified into 3 categories; **"CAUTION"**, **"WARNING"** and **"DANGER"** according to the degree of possible injury or damage and the degree of impendence of such injury or damage.
Be sure to comply with all precautions along with JIS B8370(※1) and ISO 4414(※2), as they include important content regarding safety.

⚠CAUTION	Indicates a potentially hazardous situation which may arise due to improper handling or operation and could result in personal injury or property-damage-only accidents.
⚠WARNING	Indicates a potentially hazardous situation which may arise due to improper handling or operation and could result in serious personal injury or death.
⚠DANGER	Indicates an impending hazardous situation which may arise due to improper handling or operation and could result in serious personal injury or death.

(※1) JIS B8370 : General Rules for Pneumatic Systems
(※2) ISO 4414 : Pneumatic fluid power-General rules relating to systems

⚠WARNING

●The applicability of pneumatic equipment to the intended system should be judged by the pneumatic system designer or the personnel who determined specifications for such system.

As operating conditions for products contained in this catalogue are diversified, the applicability of pneumatic equipment to the intended system should be determined by the pneumatic system designer or the personnel who determined specifications for such system after conducting an analysis or testing as necessary.
The system designer shall be responsible for assuring the intended system performance and safety.
Before making a system, the system designer should thoroughly examine all specifications for such a system and also take into consideration the possibility of any trouble with the equipment.

●The pneumatic equipment should be handled by persons who have sufficient knowledge and rich experience.

Inproper handling of compressed air will result in danger.
Assembling, operation and maintenance of machinery using pneumatic equipment should be performed by persons who have sufficient knowledge and rich experience.

●Never operate machinery nor remove the equipment until safety is assured.

- Before checking or servicing machinery and equipment, be sure to check that steps for prevention of dropping or runaway of the driven component have been completely taken.
- When removing the equipment, make sure that the above-mentioned safety measures have been done beforehand.
  Then turn off air supply and power to the system and purge compressed air in the system.
- When restarting machinery and equipment, check that proper prevention of malfunction has been provided for and then restart carefully.

●When using the pneumatic equipment in the following conditions or environments, take the proper safety measures and consult KURODA beforehand.

- Conditions and environments other than specified and outdoor use.
- Applications to nuclear power equipment, railroads, aircraft, vehicles, medical equipment, equipment connected with food and drink, amusement facilities and safety devices such as emergency interruption devices, clutch/brake circuits for a press and the likes.
- Applications which require extreme safety and will also greatly affect men and property.

PNEUMATI CGRIPPER/COMMON INSTRUCTIONS ①

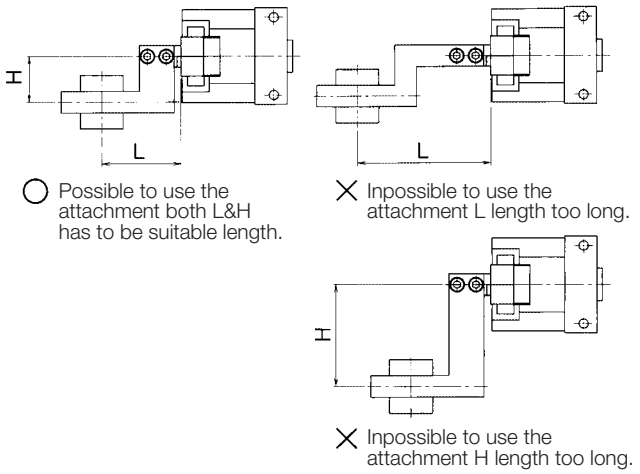
Be sure to read them before use.
Also refer to Par. “For Safety Use”and instructions mentioned for each series of pneumatic grippers.

DESIGN

⚠ WARNING

- **Especially when there is the possibility that the human body is endangered, fit a protective cover.**
  When there is the possibility that applied load or the moving part of the pneumatic gripper endangers the human body, design the system so that the human body cannot directly touch these parts.
- **Take into consideration the possibility of power failure.**
  Take proper countermeasures against equipment controlled by air pressure, electricity, hydraulic pressure, etc. so as to protect the human body and machine even if these power sources are faulty.
- **When designing a circuit, take into consideration the method of preventing the sudden action of the pneumatic gripper.**
  If compressed air is supplied with no residual pressure in the drive of the pneumatic gripper, the pneumatic gripper will suddenly actuate, causing a danger.
- **Take into consideration the action of pneumatic gripper in an emergency.**
  When the machine is stopped by a person in an emergency or stopped by the safety device due to the occurrence of outage, system trouble, etc., the pneumatic gripper may catch the human body or damage the machine according to circumstances. To avoid such an accident, take into consideration the action of pneumatic grippers in designing a system so as to prevent an injury to the human body and a damage to the machine.
- **Take into consideration the action of an pneumatic gripper when it restarts from stoppage in an emergency or abnormal state.**
  Make a design to prevent an injury to the human body and a damage to the machine when the pneumatic gripper is restarted. When it is necessary to reset the pneumatic gripper to the starting position, make a design to incorporate a safety manual control unit.
- **Use a gripper so that its grip point comes within the limited range.**
  When the grip point exceeds the limit, an excessive moment load acts on the finger sliding part, adversely affecting the life of the pneumatic gripper.

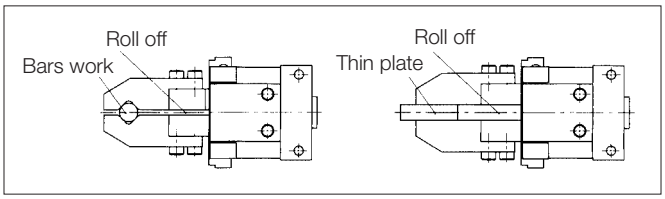
In reference to the graph of grip point range;



DESIGN

⚠ WARNING

- **Design the attachment to be short and light.**
  - If the attachment is long and heavy, the inertia force will increase at the time of opening and closing, causing a play in the finger and sometimes adversely affecting the life.
  - Even if the grip point is within the limit, design the attachment to be short and light as much as possible.
  - For long work and large work, it is recommendable to increase the size of the pneumatic gripper or use 2 or more pneumatic grippers.
- **When work is extremely narrow and thin, provide a roll off in the attachment.**
  When there is no roll off, the grip is not stabilized, resulting in a shift or poor gripping.



- **Do not use it in such a manner that excessive external force and impulse force act on.**
  The pneumatic gripper will break down, sometimes causing an injury or a damage to the machine.
- **Remodeling of pneumatic gripper**
  When disassembling and remodeling a pneumatic gripper, consult with our company beforehand.

⚠ CAUTION

- **When controlling the finger opening and closing speed for a pneumatic gripper, fit a speed controller.**
  Control the speed gradually from the low speed side until the intended speed is attained.
  As the finger opening and closing speed increases, impulsive force acting on the finger and other parts will increase, sometimes degrading repeatability at work gripping and adversely affecting the service life.

PNEUMATIC GRIPPER/COMMON INSTRUCTIONS ②

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of pneumatic grippers.

SELECTION

WARNING

- **Refer to specifications.**
  pneumatic gripper listed in this catalogue are designed for compressed air.
  When using other fluid than compressed air, contact KURODA beforehand.
  Do not use the pneumatic gripper outside the specified pressure and temperature range; this may result in a breakdown or faulty operation.
- **Select a model whose gripping force has allowance to the mass of work.**
  Selecting an improper model may result in the drop of work or other trouble.
- **Select a model whose finger opening has allowance to work.**
  < When there is no allowance >
  - Gripping condition may be unstable due to variatins in the finger opening or work diameter.
  - Use of a switch results in poor detection.

  Provide an extra stroke equivalent to hysteresis by referring to Hysteresis of Switch.

INSTALLATION

WARNING

- **Firmly tighten fixed part and joint.**
  When using pneumatic gripper for heavy-duty purposes such as continuous operation or using in vibratory place, apply a secure tightening method.
- **Do not start the system before making sure that equipment is properly operated.**
  After installing the pneumatic gripper, connect compressed air and power supply.
  Perform functional test and leak test properly and check that the system is correctly operated with safety. Then start the system.
- **When mounting a pneumatic gripper, be careful not to drop or hit it ; otherwise, a flaw or dent will occur on the pneumatic gripper.**
  Even a slight deformation will result in poor accuracy and operation failure.
- **Coating with paint**
  When coating the resin portion with paint, it may be adversely affected by paint and solvent. For the propriety of painting, contact KURODA beforehand.
  Do not peel off the nameplate affixed on the pneumatic gripper and do not erase or smear out the letter on it.
- **Provide space for maintenance and inspection.**

INSTALLATION

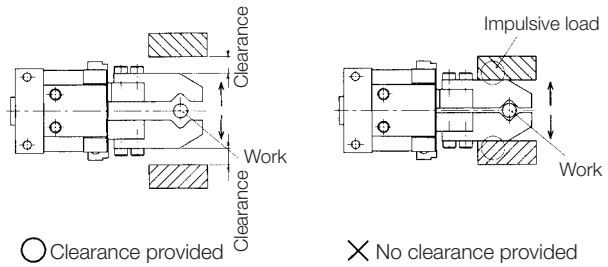
WARNING

- **Do not bring magnetism near to the pneumatic gripper from the outside.**
  The pneumatic gripper with a switch is so designed that the switch senses magnetism. If magnetism is get near to it from the outside, it will malfunction, causing an injury or damage to the machine.

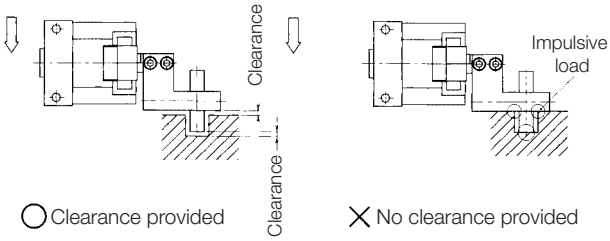
CAUTION

- **When fitting the attachment to the finger, be careful not to twist the finger.**
  Twisting results in a play or poor accuracy.
- **Make adjustment and check so that no external force is applied to the finger.**
  If a transverse load acts or an impulsive load acts on the finger repeatedly, it will cause a play or breakdown of the finger.
  Provide a clearance so that no work and attachment hit against anything at the end of opening and closing stroke of the pneumatic gripper.

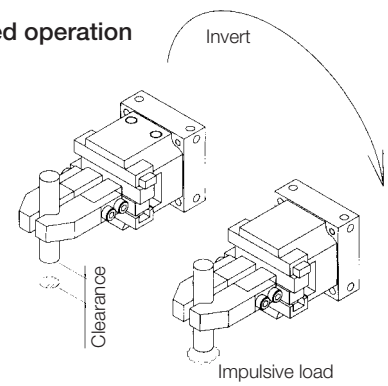
Stroke end with finger opened



Stroke end for movement of pneumatic gripper



At inverted operation



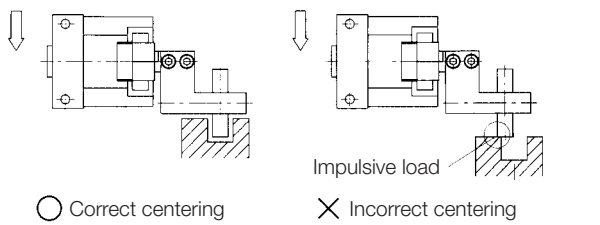
PNEUMATIC GRIPPER/COMMON INSTRUCTIONS ③

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of pneumatic grippers.

INSTALLATION

CAUTION

- **When inserting work, perform centering sufficiently so that no excessive force is applied to the finger.**
  Especially when doing a trial run, lower the supply pressure and operate the pneumatic gripper at low speed. Also operate it manually to check that no shock is found.



- **Do not wipe off the model name inscribed on a nameplate etc. with organic solvent.**
  The inscribed indication may be erased.

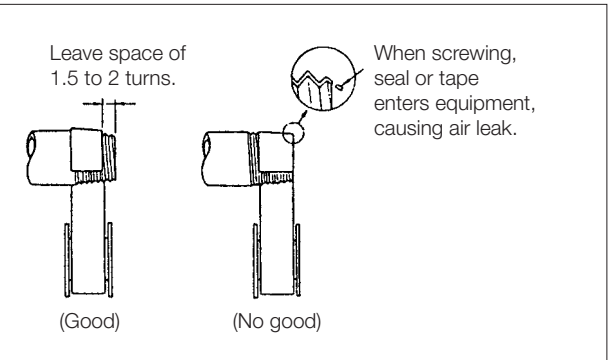
PIPING

CAUTION

- **Before piping**
  Thoroughly flush the inside of each pipe to remove chips, coolant, dust, etc. before piping.
- **Screw of pipe and joint**
  When screwing the pipe and joint, use care to prevent chips and sealant from entering the pipe and joint.
  Tighten them within a proper range of clamping torque.

Port size	Clamping torque (N·m)
M5	1.5～ 2.0
R, Rc1/8	7.0～ 9.0
R, Rc1/4	12.0～14.0
R, Rc3/8	22.0～24.0
R, Rc1/2	28.0～30.0

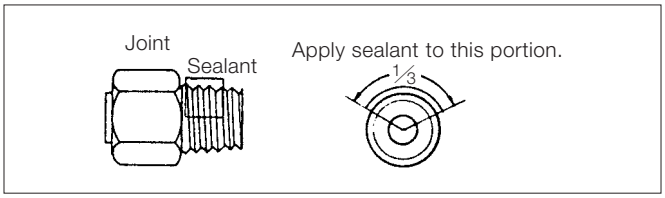
- **How to wind a seal tape**
  When winding a seal tape around the threaded portion, leave space of 1.5 to 2 thread turns.



PIPING

CAUTION

- **How to apply liquid sealant**
  When applying liquid sealant to the threaded portion, apply a proper amount to about 1/3 of the periphery of the threaded portion and then screw it.



- **Avoid wrong piping.**
  When connecting a pipe to a pneumatic gripper, be careful not to mistake the supply port by referring to the nameplate affixed to the product or the product catalogue.

LUBRICATION

CAUTION

- **Pneumatic gripper listed in this catalogue are non-lubrication.**
  The non-lubricated pneumatic gripper can be used without lubrication, but can be used with lubrication.
  When using it with lubrication, do not discontinue supplying oil. Otherwise, the applied lubricant may run off, sometimes resulting in an operation failure.
  When using a lubricant, Class 1 turbine oil ISO VG 32 (containning additive) is recommended.
  Do not use spindle oil and machine oil. Otherwise, the seal and packing may be damaged.

PNEUMATIC GRIPPER/COMMON INSTRUCTIONS ④

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of pneumatic grippers.

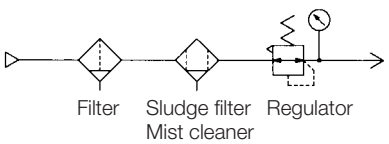
QUALITY OF AIR

⚠ WARNING

- **Use pure air**
  Compressed air containing corrosive gases, chemicals, salt, etc. causes a breakdown or operation ailure. So do not use such air.

⚠ CAUTION

- **Fit an air filter with filtration of 5 μm or fine.**
- **Install an air dryer.**
  Compressed air containing much drainage causes the operation failure of pneumatic equipment. Install an air dryer, lower the temperature and reduce drainage.
- **Take proper countermeasures against sludge.**
  If sludge produced in compressor oil enters pneumatic equipment, it will cause the operation failure of pneumatic equipment.
  It is recommendable to use compressor oil (NISSEKI FAIRCALL A68, IDEMITSU DAPHUNY SUPER CS68) featuring minimized sludge production or use a sludge filter or mist cleaner to prevent sludge from entering the pneumatic equipment.



OPERATING ENVIROMENTS

⚠ DANGER

- **Do not use pneumatic gripper in a explosive environment.**

⚠ WARNING

- **Do not use a pneumatic gripper in atmospheres containing corrosive gases, chemicals, seawater, water and vapor and in places where a solenoid valve contacts these matters.**
- **Do not use a pneumatic gripper in a place where vibrations or shocks are directly applied to it.**
- **When a pneumatic gripper is exposed to the direct sunlight, fit a protective cover to the pneumatic gripper.**
- **When a pneumatic gripper is located around a heat source, shut off the radiant heat.**
- **When installing a pneumatic gripper in the control panel, take proper heat-radiating measures so that the inside temperature may be kept within the specified temperature range.**
- **When using a pneumatic gripper in a place where it is exposed to welding spatters, provide a protective cover or other proper prevention.**
  Welding spaters may burn out the plastic parts of the pneumatic gripper, somtimes resulting in a fire.

MAINTENANCE

⚠ CAUTION

- **Check before starting maintenance**
  Check that work drop prevention and overrun prevention have been activated, then turn off air and power supply and discharge residual pressure in the system beforehand. Carefully remove work.
- **Recheck after completion of maintenance**
  When restarting the system, check that overrun prevention has been activated and then connect compressed air supply and power supply to the pneumatic system. Perform a functional test and a leak test, and check that each unit works properly and safely before starting the system.

⚠ WARNING

- **Disassembling pneumatic gripper**
  When disassembling pneumatic gripper, consult our company beforehand.

⚠ CAUTION

- **Draining**
  To maintain constant air quality, drain the air filter periodically.

HI-ROTOR DRIVEN, IRON PIECE DETECTING TYPE PROXIMITY SWITCH/COMMON INSTRUCTIONS ①

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of switches.

DESIGN AND SELECTION

⚠ WARNING

- **Use the switch within the range of specifications described in this catalogue.**
  Applying load current, voltage, temperature and shock exceeding the range of specifications will cause a damage to the switch and a faulty operation.
  Thoroughly read the specifications and use the switch within the range of the specifications.
  Especially, be sure to use the switch within the maximum contact capacity and operating current range.
- **When using the switch, keep it away from a magnetic substance by more than 10 mm.**
  When a magnetic substance other than an iron piece for detection gets near to the switch, the switch may sometimes malfunction.
- **Be careful of switch-on time in the midrange of the stroke.**
  For example, the switch is set in the midrange of the stroke of an iron piece for detection and the load is driven when the iron piece travels.
  In this case, if the iron piece moves too quickly, the switch-on time is excessively short so that the load cannot be fully moved according to circumstances.
  The travel speed of the iron piece for detection in that case is as follows :

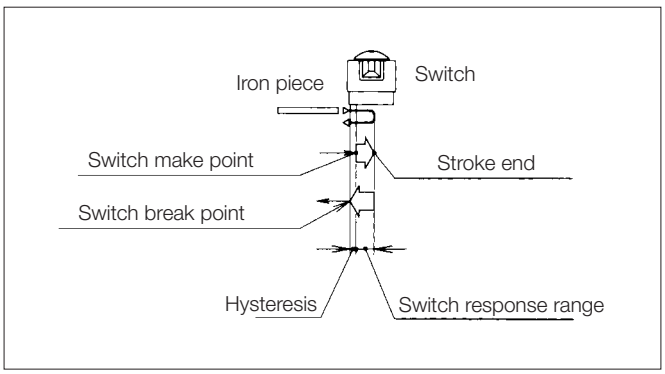
$$V = \frac{\text{Operating range of switch (mm)}}{\text{Operating time of load (ms)}} \times 1000 \quad \text{(mm/s)}$$

- **Reduce the length of wiring as much as practicable.**
  When inrush current caused by line floating capacity occures, take a proper countermeasure to absorb the rush current.
- **Do not use load that produces surge voltage.**
  A zener diode for surge protection is connected to the output side of a proximity switch. However, it may be broken if surge is repeatedly applied to it.
  When directly driving a relay, solenoid valve or other load that produces surge, use a switch with built-in surge absorbing element.
- **When using the switch in an interlock circuit, pay attention to the following points;**
  When a switch for pneumatic gripper is used for interlock signals requiring high degree of reliability, provide the switch with a mechanical protective function against trouble and malfunction or use a double-interlock system by using the switch together with other switch (sensor etc.).
  In addition, check the switch periodically to make sure that it works normally.
- **Provide space for maintenance.**
  In designing a system, take into account space for maintenance and inspection.

INSTALLATION AND ADJUSTMENT

⚠ WARNING

- **Do not drop or hit the switch.**
  When handling the switch, do not drop or hit it or do not apply an excessive shock to it (refer to specification for each switch).
- **Do not swing around the switch while holding the lead wire.**
  If excessive tensile force is applied to the lead wire, the inside wire may be broken or the internal mechanism of the switch may suffer a damage.
- **Fix the switch with prescribed clamping torque.**
  When the switch is fixed with clamping torque exceeding the prescribed value, the set screw, metal fixture, switch, etc. may be broken.
- **Set the switch at the center of the operating range.**
  The distance between the position to which the iron piece moves to turn on the switch and the position to which the iron piece moves in the opposite direction to turn off the switch is called "Hysteresis". Setting the switch at this position may sometimes result in unstable operation.
  Set the switch in such a manner that the iron piece is located at the center of the operating range (within which the switch is turned on). (When the recommended set positions are respectively described, follow such recommendation.)



⚠ CAUTION

- **Do not wipe off the model name inscribed on a nameplate etc. with organic solvent.**
  The inscribed indication may be erased.

HI-ROTOR DRIVEN, IRON PIECE DETECTING TYPE PROXIMITY SWITCH/COMMON INSTRUCTIONS ②

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of switches.

WIRING

⚠ WARNING

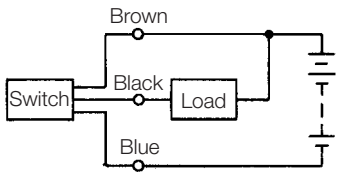
- **Properly wire in accordance with each lead wire color or terminal No.**
  In this case, be sure to turn off power to the electric circuit on the connection side.
- **Do not make the wrong wiring.**
  As each wire has its own polarity, do not mistake (+), (−), and output lines.
  Reverse wiring (replacement of "+" with "−" by mistake) of the power line is protected by the protective circuit. However, if the power line is mistaken for the output line in case of wiring, the switch will be broken.
- **Do not wire the switch together with the power line and high voltage line.**
  Wire the switch by keeping away from the power line and high voltage line.
  Otherwise, the control circuit including the switch may malfunction due to noise.
- **Avoid applying repetitive bending stress and tensile force to the lead wire.**
  When setting the switch in a moving part, sag the wiring so that repetitive stress and tensile force will not be applied to the lead wire.
  Wiring that produces repetitive bending stress and tensile force cause the breaking of wire.
  Use a switch (made to order) for flexible cables in a place exposed to torsional bending force.
- **Check for poor insulation.**
  Check lead wire connection, extension cable and terminal base for poor insulation. If poor insulation occurs, excess current will flow to the switch, sometimes resulting in a damage to the switch.
- **Connect the load to the output line before turning on power supply.**
  When the switch is turned on without connecting the output line to a relay, programmable controller (PLC), etc., an overcurrent flows momentarily, damaging the switch.
- **Do not turn on the switch with load short-circuited.**
  If the switch is turned on with load short-circuited, excess current will flow to the switch, sometimes resulting in a damage to the switch.

WIRING

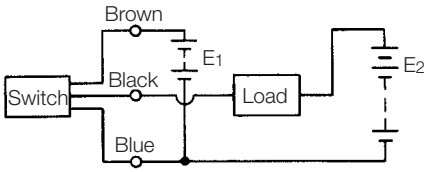
⚠ WARNING

- **It is possible to provide power supply to load and power supply to switches individually and also to use them in common.**
  When power supplies are individually provided, they should have the same voltage.

Where power supply to load and power supply to switch are commonly used :



Where power supply to load and power supply to switch are not commonly used :



E_1 and E_2 should be the same voltage.

HI-ROTOR DRIVEN, IRON PIECE DETECTING TYPE PROXIMITY SWITCH/COMMON INSTRUCTIONS ③

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of switches.

OPERATING ENVIRONMENT

DANGER

- **Never use the switch in an explosive or ignitable atmosphere.**
  As the switch is not proof against explosion, never use it in an explosive gas atmosphere or ignitable atmosphere ;
  otherwise causing an explosion or fire.

WARNING

- **Do not use the switch in a place where there is a strong magnetic field or a large current.**
  A strong magnetic field or a large current (a large-sized magnet, spot welder, etc.) will cause the malfunction of a switch.
- **Do not use the switch in a place where it is always splashed with water.**
  The switch is designed to meet structural requirements IP67 prescribed by IEC Standard. However do not use the switch in a place where it is always splashed with water; otherwise causing an insulation failure or malfunction.
- **Do not use the switch in an environment containing oil and chemicals.**
  When the switch is used in an environment containing coolant, washings, oils and chemicals, the inside of the switch is adversely affected even if it is used for a short period of time.
  When it is necessary to use the switch in such an environment, contact KURODA.
- **Do not use the switch in a place where an extreme temperature change occurs.**
  Using the switch in a place attended with an unusual temperature change will adversely affect the inside of the switch.
  When it is necessary to use the switch in such an environment, contact KURODA.
- **Do not use the switch in a place where an excessive shock occurs.**
  Check the shockproof value specified for the switch and use it below that specified value.
- **Do not use the switch in a place where surge is produced.**
  When there is a large surge source around the proximity switch, the circuit element in the switch may be adversely affected.
- **Be careful of contact with a magnetic substance.**
  Note that, if a magnetic substance other than an iron piece for detection contacts the switch, the switch may sometimes malfunction. Also note that, if iron powder and weld spatter accumulate on the switch during operation, the same condition as above-mentioned may occur.

MAINTENANCE AND INSPECTION

WARNING

Perform the following maintenance and inspection periodically.

- **Check the switch set screw and metal fixture for looseness and retighten as necessary.**
  If the switch set screw and metal fixture are loosened, the switch set position will shift, resulting in an unstable operation or malfunction.
  Readjust the set position and tighten the set screw and fixture.
- **Check the lead wire for damage.**
  A damage to the coating of the lead wire may lead to insulation failure and breaking of wire.
  When a damage is found, change the switch and repair the lead wire immediately.

MAGNETIC PROXIMITY SWITCH/COMMON INSTRUCTIONS ①

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of switches.

DESIGN AND SELECTION

⚠ WARNING

- **Use the switch within the range of specifications described in this catalogue.**
  Applying load current, voltage, temperature and shock exceeding the range of specifications will cause a damage to the switch and a faulty operation.
  Throughly read the specifications and use the switch within the range of the specifications.
  Especially, be sure to use the switch within the maximum contact capacity and load current range.
- **Use care to prevemt one gripper with a switch from coming near to other gripper with a switch.**
  If a gripper with a switch comes near each other excessively, magnetism may interfere with both switches, sometimes causing a malfunction.
- **Pay attention to switch-on time at the center of stroke.**
  Example : The piston is set at the center of stroke and load is driven when the piston passes the switch. In this case, if piston speed is extremely high, operating time is short even when the switch is turned on.
  As a result, load cannot be fully moved according to circumstances.
  In this case, piston speed is expressed as follows :

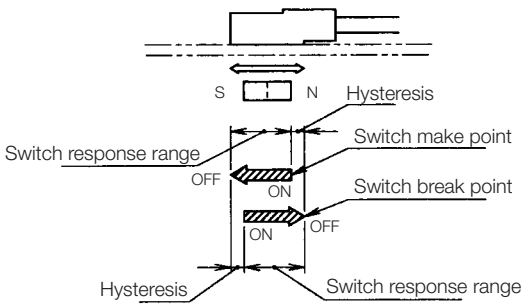
$$V = \frac{\text{Operating range of switch (mm)}}{\text{Operating time of load (ms)}} \times 1000 \quad \text{(mm/s)}$$

- **When inrush current caused by line floating capacity occures, take a proper countermeasure to absorb the rush current.**
- **Be careful of leak current.**
  For a 2-wire proximity switch, current (leak current) flows in it to operate the internal circuit even if the switch is turned off.
  When 2 or more switches are connected in parallel, leak current increases corresponding to the number of connected switches.
  When leak current is larger than operating current for turning off load, the load is not turned off.
- **Be careful of internal voltage drop of switch.**
  When connecting 2-wire proximity switches in series, pay attention to the same points as those for connecting reed switches. However, note that the internal voltage drop is generally larger than that of reed switches.
- **Do not use load that produces surge voltage.**
  A zener diode for surge protection is connected to the output side of a proximity switch. However, it may be broken if surge is repeatedly applied to it.
  When directly driving a relay, solenoid valve or other load that produces surge, use a switch with built-in surge absorbing element.
- **When using the switch in an interlock circuit, pay attention to the following points;**
  When a switch for pneumatic gripper is used for interlock signals requiring high degree of reliability, provide the switch with a mechanical protective function against trouble and malfunction or use a double-interlock system by using the switch together with other switch (sensor etc.).
  In addition, check the switch periodically to make sure that it works normally.

INSTALLATION AND ADJUSTMENT

⚠ WARNING

- **Provide space for maintenance.**
  In designing a system, take into account space for maintenance and inspection.
- **Do not drop or hit the switch.**
  When handling the switch, do not drop or hit it or do not apply an excessive shock to it (refer to specification for each switch).
- **Do not swing around the switch while holding the lead wire.**
  If excessive tensile force is applied to the lead wire, the inside wire may be broken or the internal mechanism of the switch may suffer a damage.
- **Fix the switch with prescribed clamping torque.**
  When the switch is fixed with clamping torque exceeding the prescribed value, the set screw, metal fixture, switch, etc. may be broken.
- **Set the switch at the center of its response range.**
  The magnet (piston) moves to a point at which it turns on the switch and then it moves in opposite direction to other point at which it turns off the awitch. The distance between these points is called hysteresis.
  When the switch is installed within this distance, its operation may be sometimes. unstable.
  Set the switch so that magnet is located at the center of its response range (within which the switch is turned on). (Set positions described in this catalog are the most suitable positions at the stroke end.)



Hysteresis varies according to operating conditions.

WIRING

⚠ WARNING

- **Properly wire in accordance with each lead wire color or terminal No.**
  In this case, be sure to turn off power to the electric circuit on the connection side.
- **Do not make wrong wiring.**
  As DC current has polarity, do not confuse (+) with (−).
  Even if the connection of wiring of a 2-lead wire switch is reversed, the protective circuit prevents the breakdown of the switch. In this case, however, the switch is left turned on. Note that, if the connection of wiring of a 2-lead wire switch is reversed with load short-circuited, the switch will be broken.
  If the power line of a 3-lead wire switch is reversely wired ("+" replaces with "−"), the protective circuit will protect the switch. However, note that, if the power line is replaced with the output line by mistake, the switch will be broken.

MAGNETIC PROXIMITY SWITCH/COMMON INSTRUCTIONS ②

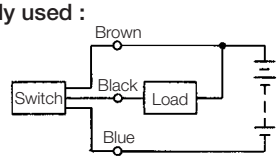
Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of switches.

WIRING

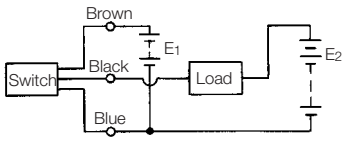
⚠ WARNING

- **Do not wire the switch together with the power line and high voltage line.**
  Wire the switch by keeping away from the power line and high voltage line.
  Otherwise, the control circuit including the switch may malfunction due to noise.
- **Avoid applying repetitive bending stress and tensile force to the lead wire.**
  When setting the switch in a moving part, sag the wiring so that repetitive stress and tensile force will not be applied to the lead wire.
  Wiring that produces repetitive bending stress and tensile force cause the breaking of wire.
- **Check for poor insulation.**
  Check lead wire connection, extension cable and terminal base for poor insulation. If poor insulation occurs, excess current will flow to the switch, sometimes resulting in a damage to the switch.
- **Be sure to connect load before turning on power supply.**
  When a 2-lead wire switch is turned on without connecting load such as relay, PLC, etc., excess current will momentarily flow to the switch, resulting in a damage to the switch.
- **Do not turn on the switch with load short-circuited.**
  If the switch is turned on with load short-circuited, excess current will flow to the switch, sometimes resulting in a damage to the switch.
- **It is possible to provide power supply to load and power supply to switches individually and also to use them in common.**
  When power supplies are individually provided, they should have the same voltage.

Where power supply to load and power supply to switch are commonly used :



Where power supply to load and power supply to switch are not commonly used :



E_1 and E_2 should be the same voltage.

OPERATING ENVIRONMENT

⚠ DANGER

- **Never use the switch in an explosive or ignitable atmosphere.**
  As the switch is not proof against explosion, never use it in an explosive gas atmosphere or ignitable atmosphere ;
  otherwise causing an explosion or fire.

OPERATING ENVIRONMENT

⚠ WARNING

- **Do not use the switch in a place where there is a strong magnetic field or a large current.**
  If the switch is used in a place where there is a strong magnetic field or a large current (large magnet, spot welding machine, etc.), the switch will malfunction or the magnet in the cylinder will be demagnetized.
- **Do not use the switch in a place where it is always splashed with water.**
  The switch is designed to meet structural requirements IP67 prescribed by IEC Standard. However do not use the switch in a place where it is always splashed with water; otherwise causing an insulation failure or malfunction.
- **Do not use the switch in an environment containing oil and chemicals.**
  When the switch is used in an environment containing coolant, washings, oils and chemicals, the inside of the switch is adversely affected even if it is used for a short period of time.
  When it is necessary to use the switch in such an environment, contact KURODA.
- **Do not use the switch in a place where an extreme temperature change occurs.**
  Using the switch in a place attended with an unusual temperature change will adversely affect the inside of the switch.
  When it is necessary to use the switch in such an environment, contact KURODA.
- **Do not use the switch in a place where surge is produced.**
  When there is a large surge source around the proximity switch, the circuit element in the switch may be adversely affected.
- **Be careful of adjucent magnetic material. Keep the switch away from magnetic material by more than 10 mm.**
  When there is magnetic material such as iron close to the cylinder with a built-in magnet is absorbed and thus the switch may not operate according to circumstances.
  Note that, when chips and iron powder such as weld spatters accumulate during operation, the same situation as above-mentioned will also occur.

MAINTENANCE AND INSPECTION

⚠ DANGER

Perform the following maintenance and inspection periodically.

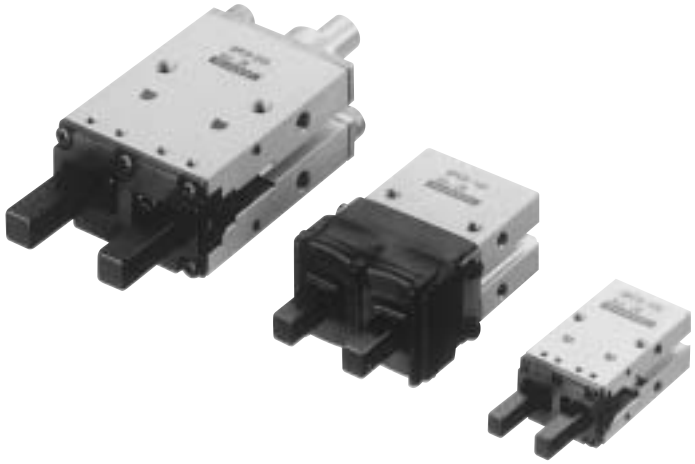
- **Check the switch set screw and metal fixture for looseness and retighten as necessary.**
  If the switch set screw and metal fixture are loosened, the switch set position will shift, resulting in an unstable operation or malfunction.
  Readjust the set position and tighten the set screw and fixture.
- **Check the lead wire for damage.**
  A damage to the coating of the lead wire may lead to insulation failure and breaking of wire.
  When a damage is found, change the switch and repair the lead wire immediately.

CYLINDER-DRIVEN PNEUMATIC GRIPPER

GPCR Series

PARALLEL GIPPER WITH CROSS ROLLER

- **High degree of gripping accuracy and rigidity**
  Use of a cross roller guide in the finger has realized long service life, high degree of gripping accuracy (less than ±0.01 mm) and high rigidity.
- **Dustproof cover and adaptor**
  Optionally avalable
- **Switches available as attachment**
  GPCR Series can be equipped with 2 switches to check that finger opens and closes.
  The switch is fitted into the groove provided on the side of the gripper body.
- **Gripper body can be installed to turn to any of 3 directions.**



SPECIFICATIONS

Model No.		Unit	GPCR-10C	GPCR-16C	GPCR-20C	GPCR-25C
Cylinder ID		mm	10	16	20	25
Operating method			Double acting type			
Fluid			Non-lubricated air			
Operating pressure range		MPa	0.18～0.7	0.12～0.7	0.1～0.7	
Operating ambient temperature		℃	0～60			
Port size			M3×0.5	M5×0.8		
Repeatability		mm	±0.01			
Maximum stroke		mm	4	8	12	14
Gripping force	Opening	N	9.4	25.5	45.7	67
	Closing	N	14.6	34	60.9	87
Mass		g	48	120	218	366

Model No.		Unit	GPCR-10A	GPCR-16A	GPCR-20A	GPCR-25A
Cylinder ID		mm	10	16	20	25
Operating method			Normally open, single acting type			
Fluid			Non-lubricated air			
Operating pressure range		MPa	0.35～0.7	0.25～0.7		
Operating ambient temperature		℃	0～60			
Port size			M3×0.5	M5×0.8		
Repeatability		mm	±0.01			
Maximum stroke		mm	4	8	12	14
Gripping force	Opening	N	4.9	21	36.4	54
	Closing	N	2	3.9	6.9	13.7
Mass		g	49	121	220	368

(Note) • Gripping force is the value at 0.5 MPa and L (length to grip point)=30 mm. Gripping force at the time of opening by single-acting type means spring force.
• When using it at temperature of 5℃ or below, use dry air that has passed through an air dryer to prevent condensation, freeze, etc.

ORDERING INSTRUCTIONS

GPCR - 10 C - JN - HAE - ZE135 A 2

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①Model No.

②Cylinder ID

10	ϕ 10
16	ϕ 16
20	ϕ 20
25	ϕ 25

③Operating method

C	Double acting type
A	Normally open, single acting type

④Dustproof cover (made to order)

No mark	No cover
JN	With nitril rubber cover
JF	With fluoro rubber cover
JS	With silicone rubber cover

⑤Adaptor (made to order)

No mark	No adaptor
HAE	With male adaptor
HFE	With female adaptor
HFEL	With female adaptor

(Note) HFEL : ϕ 16 alone

⑥Switch

No mark	No switch	
ZE135	DC10～28V	2-wire proximity switch
ZE235	DC4.5～28V	
ZE155	DC10～28V	3-wire proximity switch
ZE255	DC4.5～28V	

⑦Switch lead length

No mark	No switch
A	1m
B	3m

⑧Number of switch

No mark	No switch
1	With 1 switch
2	With 2 switches

OPTION

DUSTPROOF COVER SET

It is a set of dustproof cover and machine screw with cross recess.

• **ORDERING INSTRUCTIONS**

JN-03 16

- Applicable grippers
  - 10 : GPCR10
  - 16 : GPCR16
  - 20 : GPCR20
  - 25 : GPCR25
- For GPCR Series
- Material of cover
  - JN : Nitril rubber cover
  - JF : Fluoro rubber cover
  - JS : Silicone rubber cover

MASS OF DUSTPROOF COVER

(Unit : g)

Model No. of applicable gripper	Material of dustproof cover		
	Nitril rubber	Fluoro rubber	Silicone rubber
GPCR10	6	7	6
GPCR16	8	10	8
GPCR20	12	16	12
GPCR25	15	20	15

Parallel Gripper with Switch

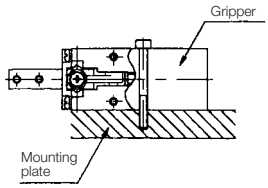
ZE type proximity switch

Lead wire type

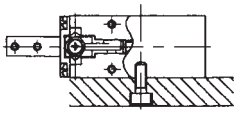
Model No. of sitch		Load voltage (V)	Load current (mA)	Indicator Lamp (Lights up at ON.)	Applications
2-wire type	ZE135	DC10～28	4～20	Red LED	Relay PLC IC circut
	ZE235				
3-wire type	ZE155	DC4.5～28	max. 50		
	ZE255				

EXAMPLE OF MOUNTING

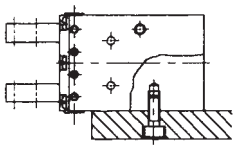
Mounting with through hole body
(Switch cannot be mounted.)



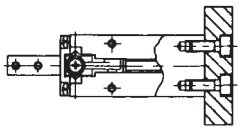
Mounting with set screw on both sides of body



Mounting with set screw on side of body

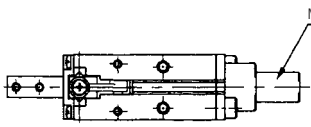


Mounting with set screw on bottom of body

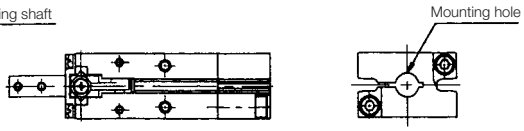


(When mounting a switch, it is necessary to povide a recess, because there is the projection of the switch.)

Mounting with adaptor



HAE type

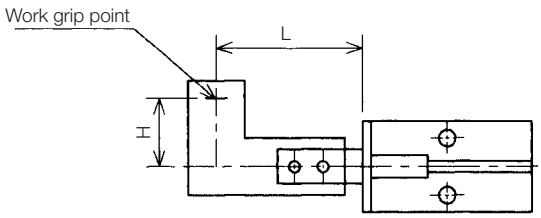


HFE, HFEL type

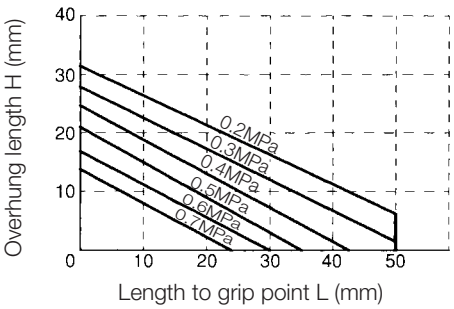
LIMITING RANGE AT GRIP POINT

⚠ CAUTION

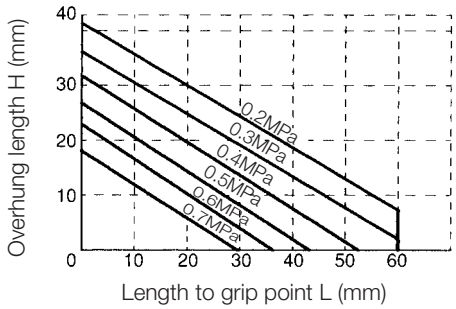
- Set length to grip point L and overhung length H for the attachment fitted to the finger to come within the limiting range shown in Fig. below : If they are set outside the limiting range, excessively large moment is applied to the finger and guide, thus adversely affecting the life and accuracy of the gripper.
- Even if the attachment is set within the range shown in Fig. below, make it small and light as much as possible.



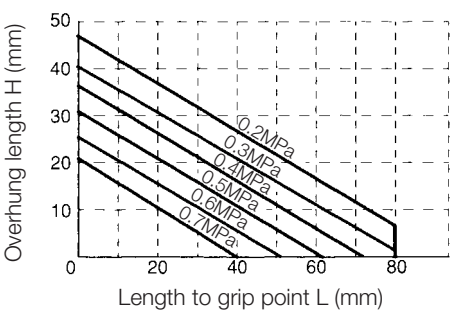
GPCR-10



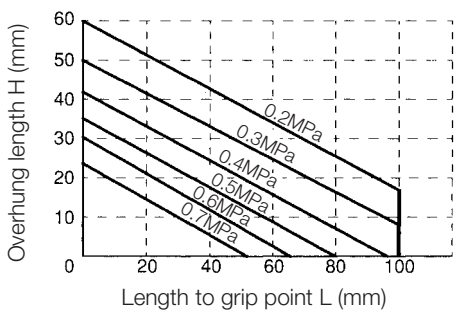
GPCR-16



GPCR-20



GPCR-25



HOW TO SEARCH FOR GRIPPING FORCE

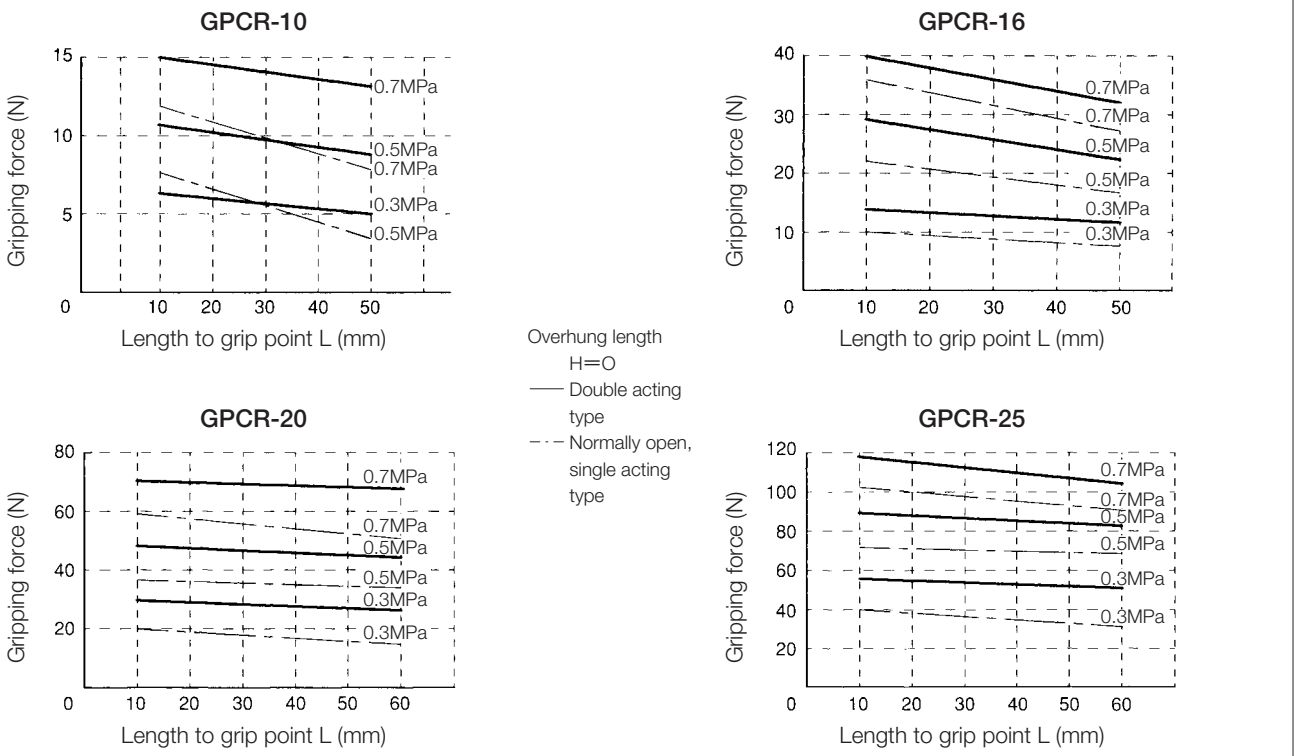
Read gripping force that satisfies the following conditions from Fig. below :

- Set the work gripping force at 10 to 20 times as much as work load.
- Set the gripping force at the time of moving the gripper with work gripped at 30 to 50 times as much as work load. It is required to prevent the jumping out and dropping of work while the gripper is moving.

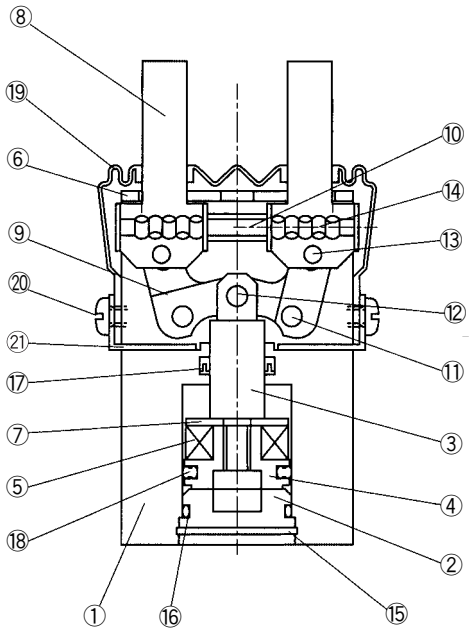
⚠ CAUTION

- Set gripping force by referring to the following guide value. In this case, take into account an allowance as much as possible.
- If great acceleration or impact is applied when carrying work, gripping force over the following guide value will be needed.

AVERAGE GRIPPING FORCE (Effective value)



CONSTRUCTIONS AND MAIN PARTS

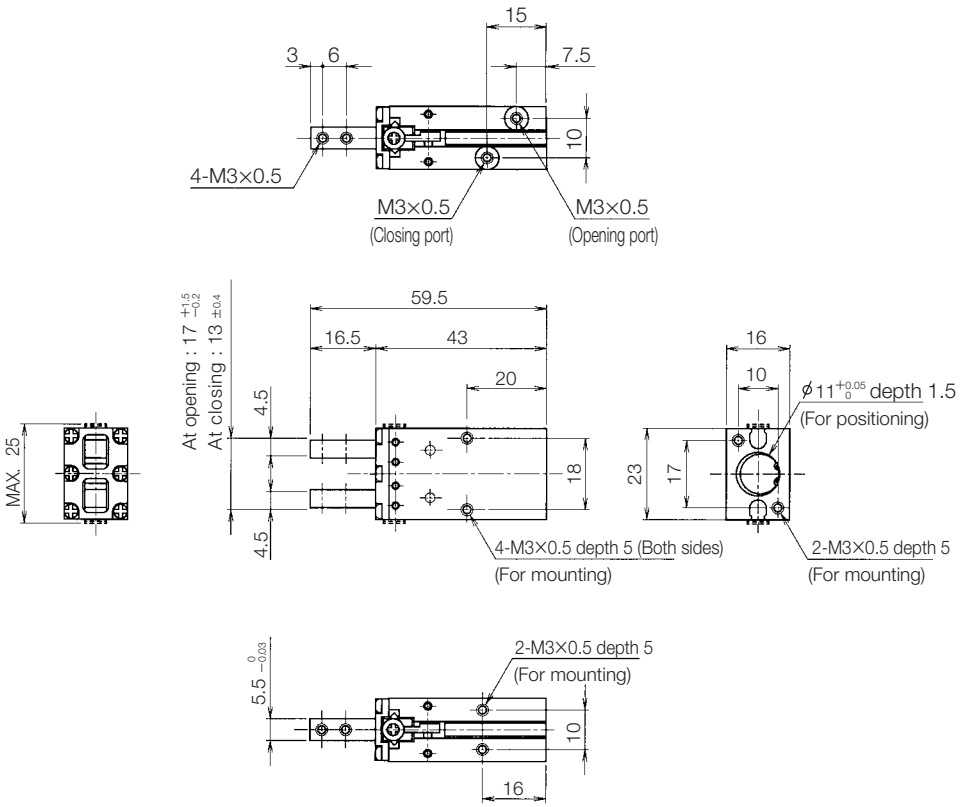


No.	Description	Material
1	Body	Aluminium alloy
2	Head cover	Aluminium alloy
3	Piston rod	Stainless steel
4	Piston	Aluminium alloy
5	Magnet	—
6	Hold-down cover	Carbon steel
7	Hold-down cover	Aluminium alloy
8	Lever	Carbon tool steel
9	Action lever	Carbon steel
10	Rail	Carbon tool steel
11	Fulcrum pin	Carbon tool steel
12	Pres-fit pin	Carbon steel
13	Roller	High carbon chromium bearing steels
14	Roller	High carbon chromium bearing steels
15	Snap ring for hole	Hard steel
16	O-ring	NBR
17	R-packing	NBR
18	P-packing	NBR
19	Dustproof cover	—
20	Machine screw with cros recess	Carbon steel
21	Hold-down cover	Stainless steel

DIMENSIONS

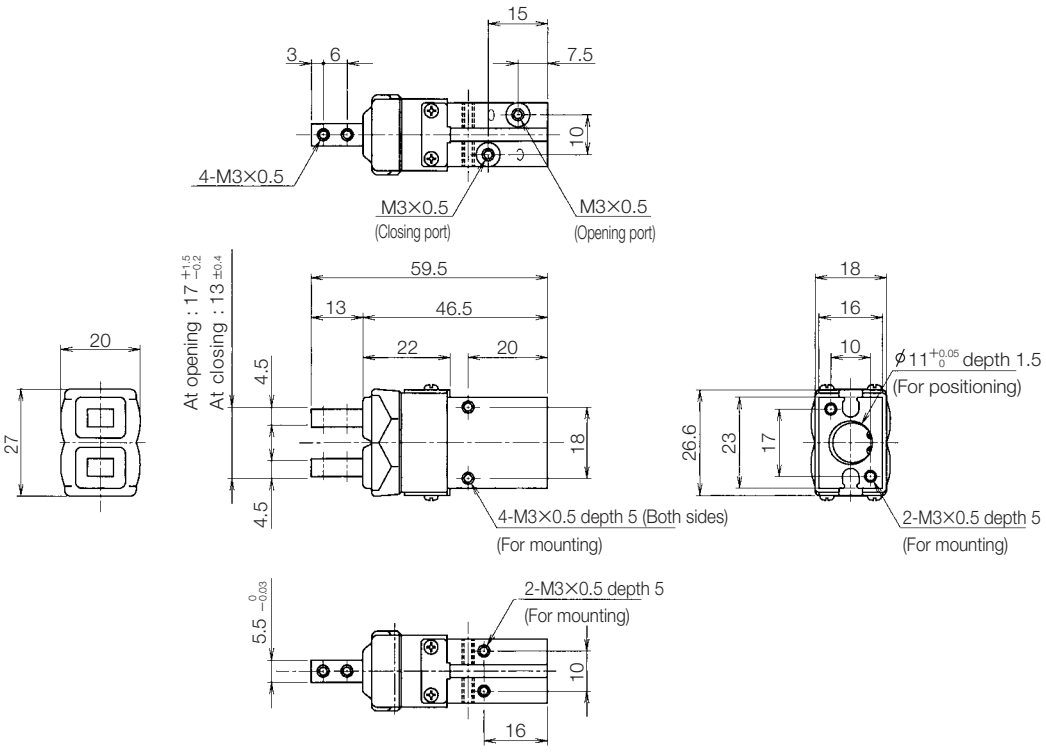
GPCR-10C・A

(Unit : mm)



GPCR-10C・A-J

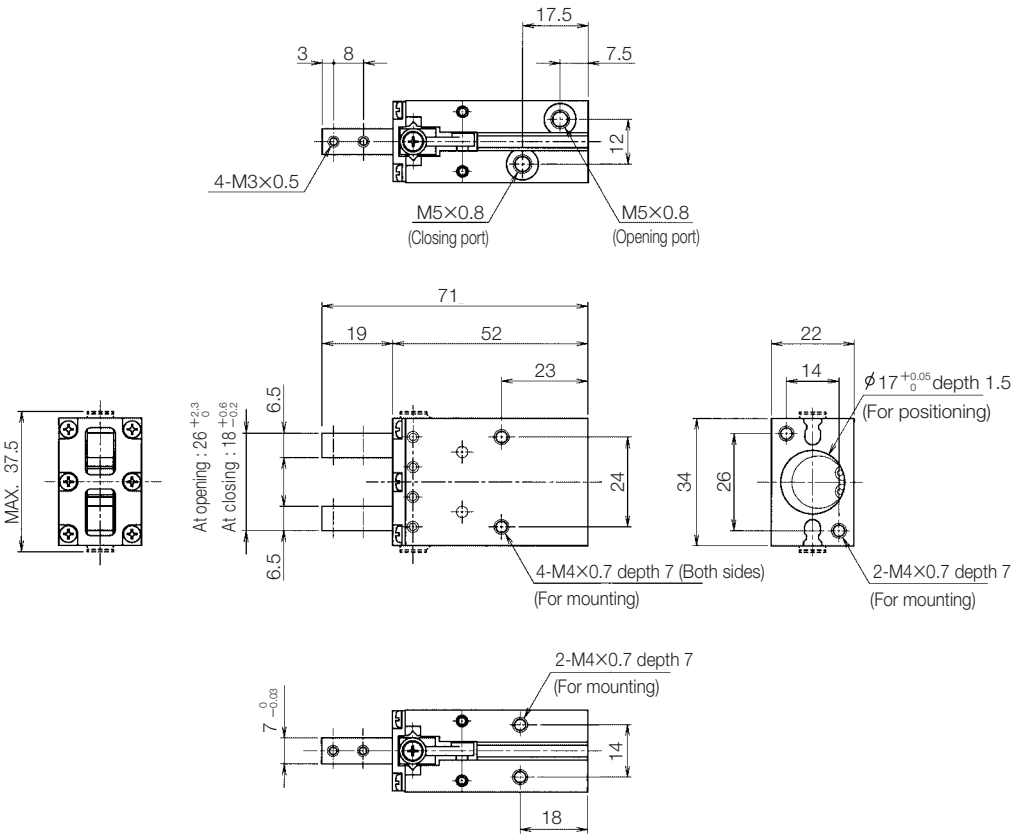
(Unit : mm)



DIMENSIONS

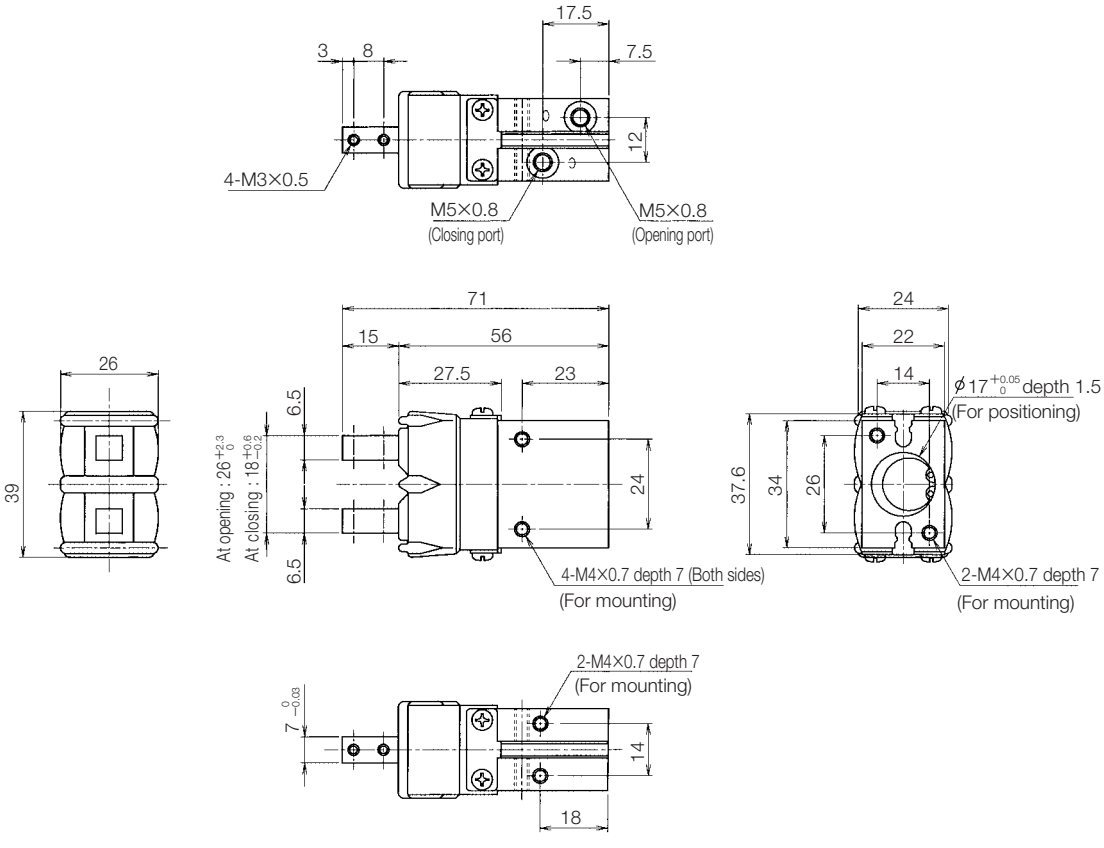
GPCR-16C・A

(Unit : mm)



GPCR-16C・A-J

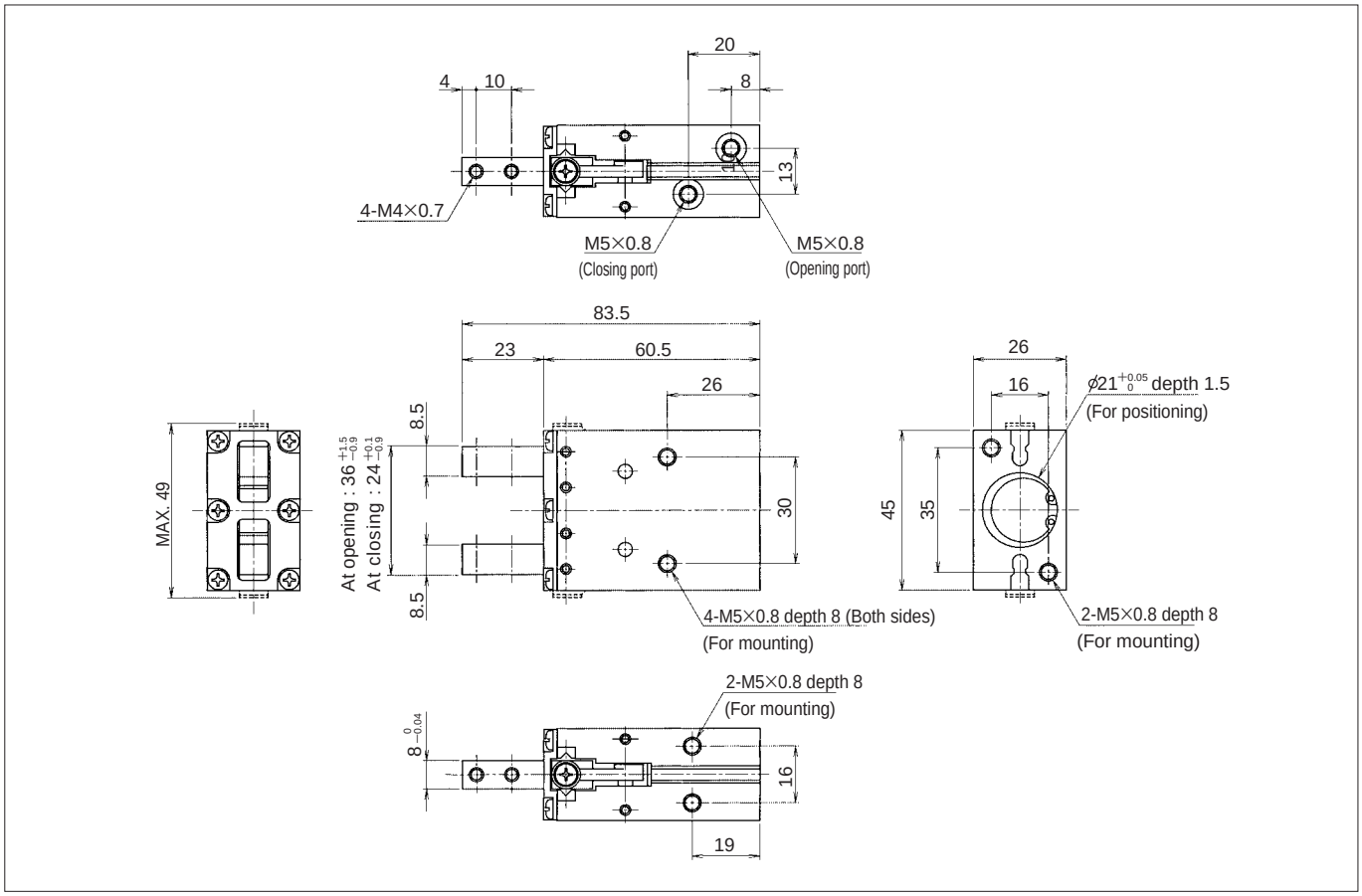
(Unit : mm)



DIMENSIONS

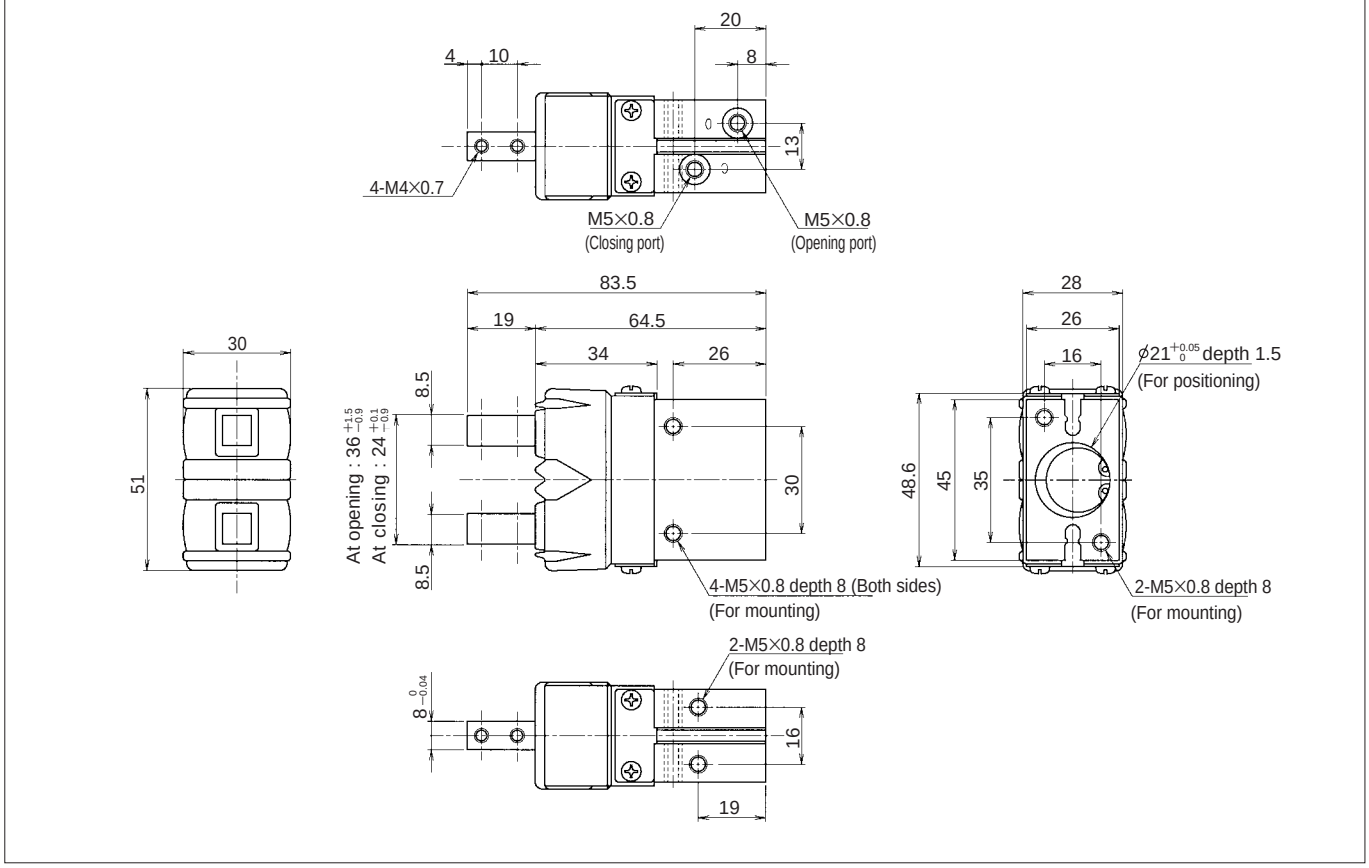
GPCR-20C・A

(Unit : mm)



GPCR-20C・A-J

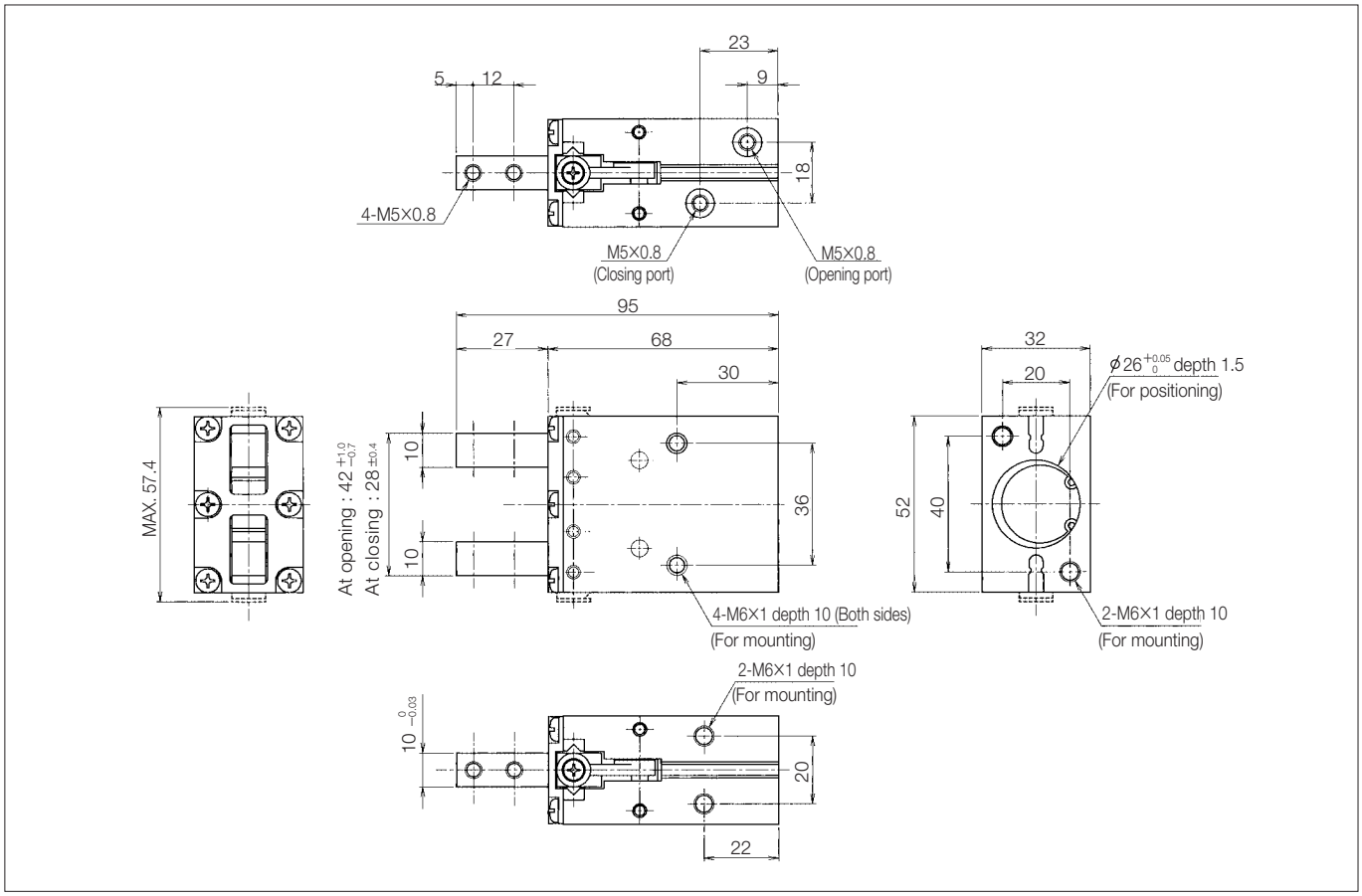
(Unit : mm)



DIMENSIONS

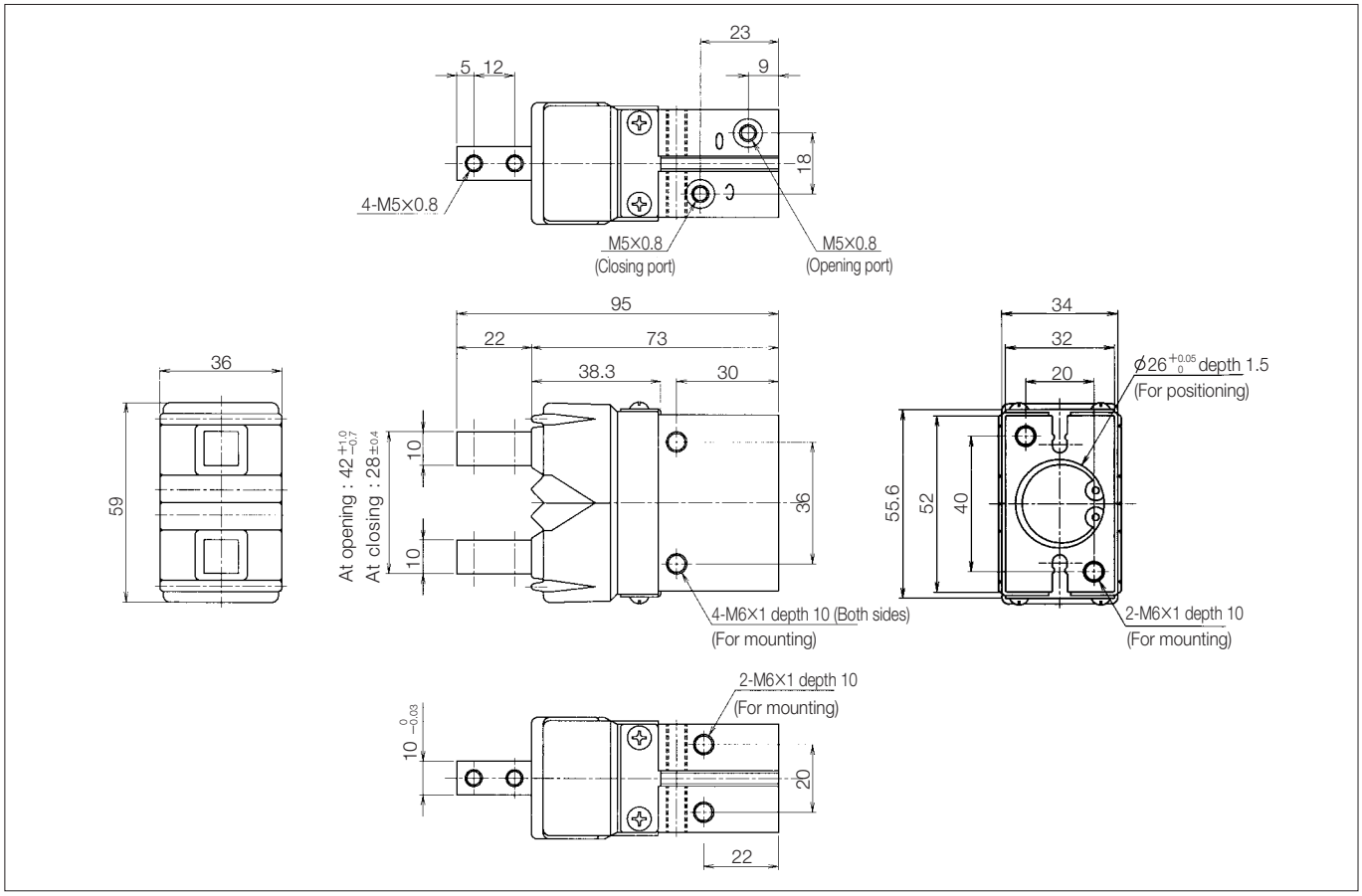
GPCR-25C・A

(Unit : mm)



GPCR-25C・A-J

(Unit : mm)

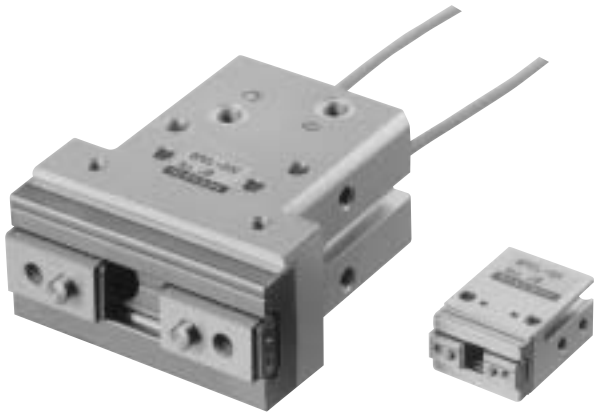


CYLINDER-DRIVEN PNEUMATIC GRIPPER

GPCL Series

PARALLEL GRIPPER WITH LINEAR GUIDE

- **High degree of gripping accuracy and rigidity**
  Use of a linear guide in the finger has realized long service life, high degree of gripping accuracy and high rigidity.
- **High degree of repeatability : ±0.01 mm or less**
- **High degree of centering accuracy : ±0.07 mm or less**
- **Two switches available as attachment**
  This series can be equipped with 2 switches to check that finger opens and closes. The switch is fitted into the groove provided on the side of the gripper body.
- **Optional adaptor**
  Optional adaptors are available.
- **Gripper body can be installed to turn to any of 3 directions.**



SPECIFICATIONS

Model No.		Unit	GPCL-8C	GPCL-10C	GPCL-16C	GPCL-20C	GPCL-32C	GPCL-50C
Cylinder ID		mm	8	10	16	20	32	50
Operating method			Double acting type					
Fluid			Non-lubricated air					
Operating pressure range		MPa	0.22～0.7	0.2～0.7	0.12～0.7	0.1～07		
Operating ambient temperature		℃	0～60					
Port size			M3×0.5		M5×0.8			
Repeatability		mm	±0.01					
Maximum stroke		mm	4	6.5	10	14	22	36
Gripping force	Opening	N	5.78	9.4	26	45	157.8	347.9
	Closing	N	9.9	15	39	60	176.4	414.5
Mass		g	22	80	159	329	664	1850

Model No.		Unit	GPCL-8A	GPCL-10A	GPCL-16A	GPCL-20A
Cylinder ID		mm	8	10	16	20
Operating method			Normally open, single acting type			
Fluid			Non-lubricated air			
Operating pressure range		MPa	0.4～0.7	0.35～0.7	0.25～0.7	
Operating ambient temperature		℃	0～60			
Port size			M3×0.5		M5×0.8	
Repeatability		mm	±0.01			
Maximum stroke		mm	4	6.5	10	14
Gripping force	Opening	N	4.1	6.8	20	34
	Closing	N	2.7	2.4	5.4	7.3
Mass		g	23	81	159	330

(Note) • Gripping force is the value at 0.5 MPa and L (length to grip point)=30 mm. Gripping force at the time of opening by single-acting type means spring force.
• When using it at temperature of 5℃ or below, use dry air that has passed through an air dryer to prevent condensation, freeze, etc.

ORDERING INSTRUCTIONS

GPCL - 10 C - HAE - ZE135 A 2

① ② ③ ④ ⑤ ⑥ ⑦

①Model No.

②Cylinder ID

8	φ8
10	φ10
16	φ16
20	φ20
32	φ32
50	φ50

③Operating method

C	Double acting type
A	Normally open, single acting type

④Adaptor (made to order)

No mark	No adaptor
HAE	With male adaptor
HFE	With female adaptor
HFEL	With female adaptor

(Note) HFEL : φ16 alone
No adaptor is provided for φ32 and φ50.

⑤Switch

No mark	No switch	
ZE135	DC10～28V	2-wire proximity switch
ZE235	DC4.5～28V	
ZE155	DC10～28V	3-wire proximity switch
ZE255	DC4.5～28V	

⑥Switch lead length

No mark	No switch
A	1m
B	3m

⑦Number of switch

No mark	No switch
1	With 1 switch
2	With 2 switches

Parallel Gripper with Switch

ZE type proximity switch

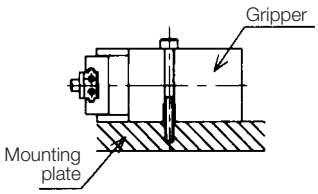
Lead wire type

Model No. of sitch		Load voltage (V)	Load current (mA)	Indicator Lamp (Lights up at ON.)	Applications
2-wire type	ZE135	DC10～28	4～20	Red LED	Relay PLC IC circut
	ZE235				
3-wire type	ZE155	DC4.5～28	max. 50		
	ZE255				

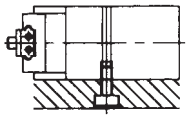
PARALLEL GRIPPER/GPCL Series

EXAMPLE OF MOUNTING

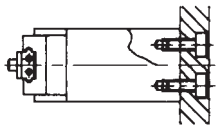
Mounting with through hole on body
(Switch can be fitted to models of ϕ8 and ϕ32.)



Mounting with set screw on backside of body
(Except model of ϕ8)

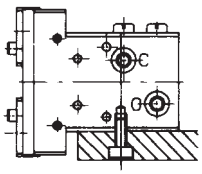


Mounting wit set screw on bottm of body

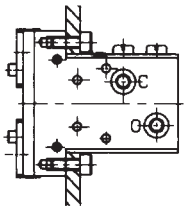


(When mounting a switch, it is necessary to povide a recess, because there is the projection of the switch.)

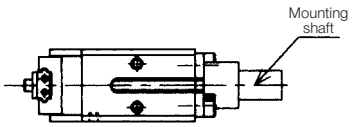
Mounting with set screw on side of body



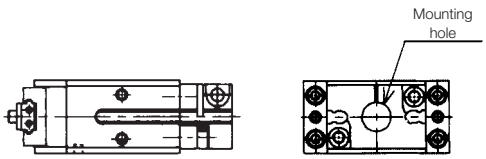
Mounting with set screws on side bottom of body
(Except model of ϕ8)



Mounting with adaptor
(ϕ10, ϕ16 and ϕ20 alone)



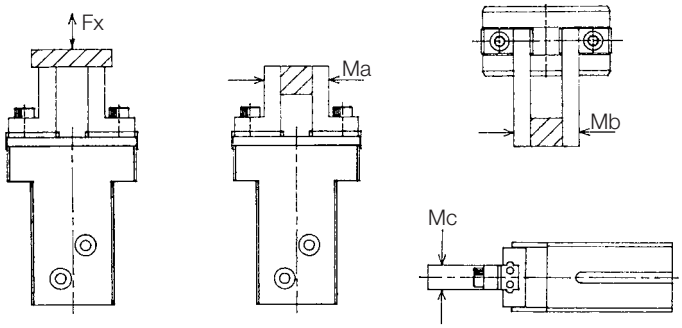
HAE type



HFE, HFEL type

ALLOWABLE LOAD AND ALLOWABLE MOMENT

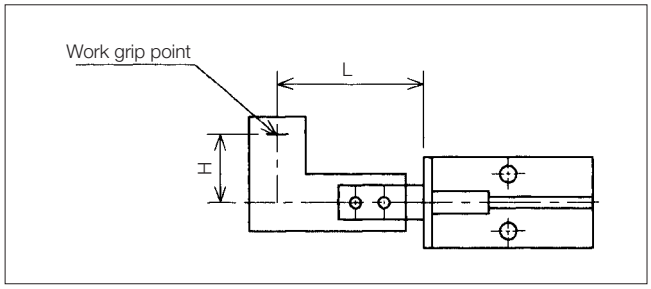
Model No.	Fx (N)	Ma (N・m)	Mb (N・m)	Mc (N・m)
GPCL-8	12	0.04	0.04	0.08
GPCL-10	50	0.4	0.4	0.8
GPCL-16	120	1.0	1.0	2.0
GPCL-20	200	1.5	1.5	3.0
GPCL-32	350	3.0	3.0	6.0
GPCL-50	600	5.5	6.0	10



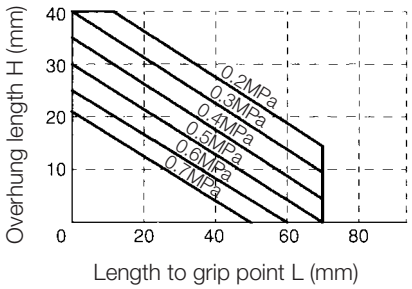
LIMITING RANGE AT GRIP POINT

⚠ CAUTION

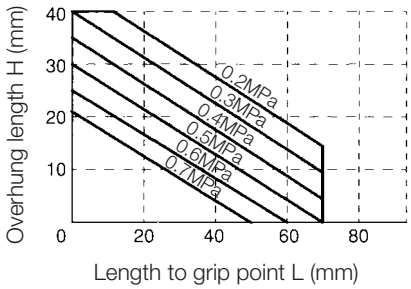
- Set length to grip point L and overhung length H for the attachment fitted to the finger to come within the limiting range shown in Fig. below :
  If they are set outside the limiting range, excessively large moment is applied to the finger and guide, thus adversely affecting the life and accuracy of the gripper.
- Even if the attachment is set within the range shown in Fig. below, make it small and light as much as possible.



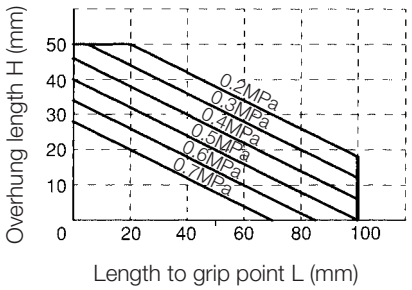
GPCL-8



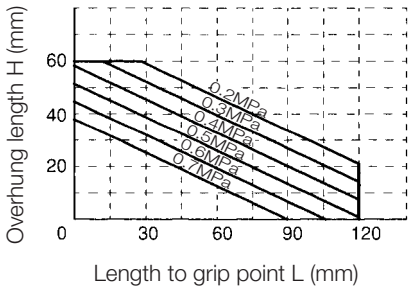
GPCL-10



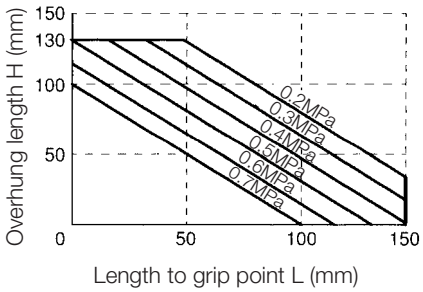
GPCL-16



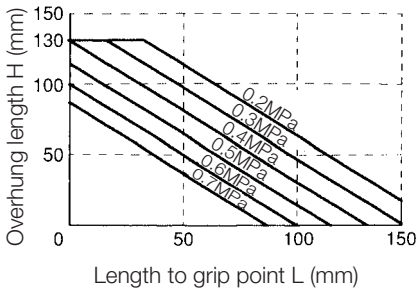
GPCL-20



GPCL-32



GPCL-50



HOW TO SEARCH FOR GRIPPING FORCE

Read gripping force that satisfies the following conditions from Fig. below :

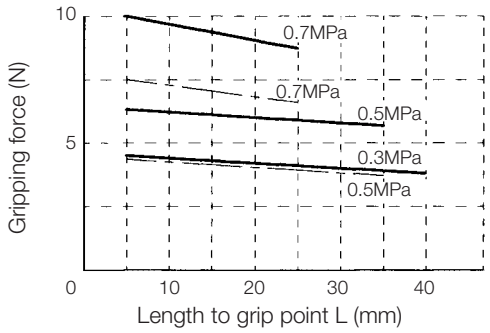
- Set the work gripping force at 10 to 20 times as much as work load.
- Set the gripping force at the time of moving the gripper with work gripped at 30 to 50 times as much as work load. It is required to prevent the jumping out and dropping of work while the gripper is moving.

⚠ CAUTION

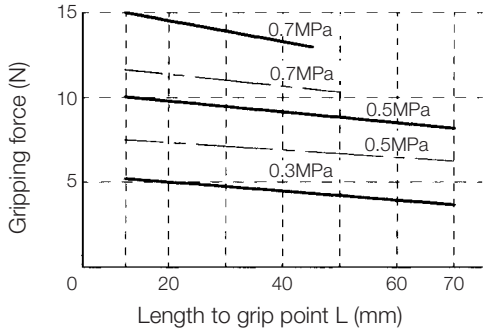
- Set gripping force by referring to the following guide value. In this case, take into account an allowance as much as possible.
- If great acceleration or impact is applied when carrying work, gripping force over the following guide value will be needed.

AVERAGE GRIPPING FORCE (Effective value)

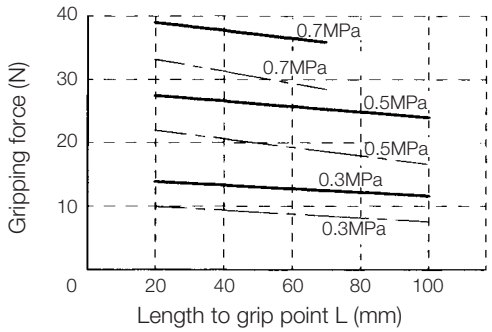
GPCL-8



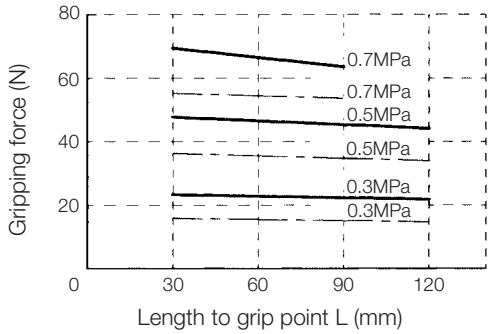
GPCL-10



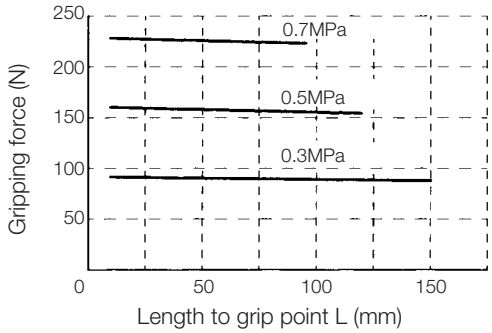
GPCL-16



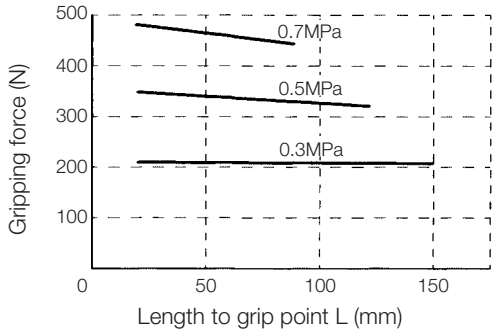
GPCL-20

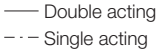


GPCL-32

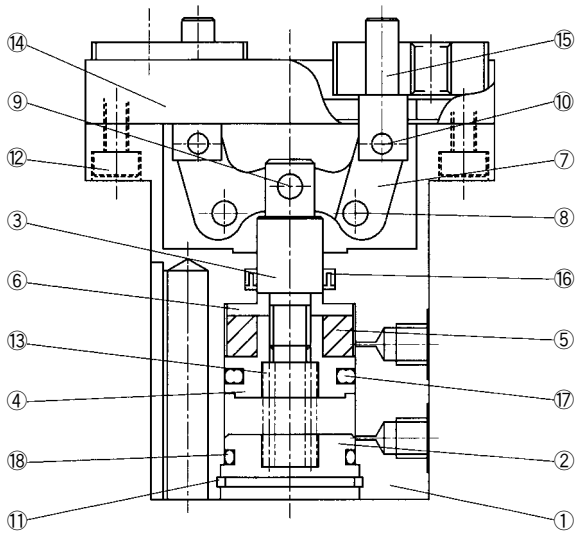


GPCL-50





CONSTRUCTIONS AND MAIN PARTS

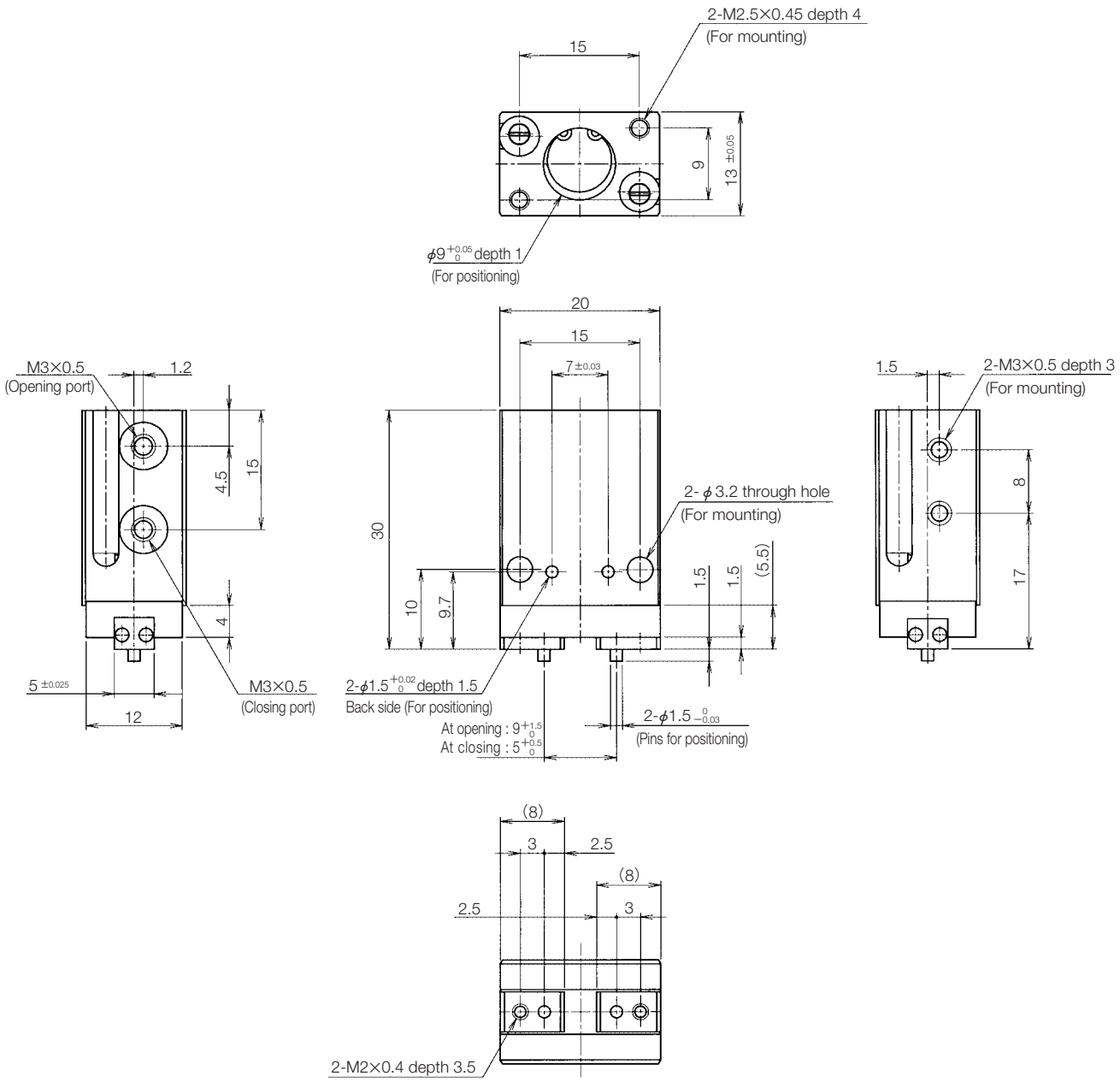


No.	Description	Material
1	Body	Aluminium alloy
2	Head cover	Aluminium alloy
3	Piston rod	Stainless steel
4	Piston	Aluminium alloy
5	Magnet	—
6	Hold-down cover	Aluminium alloy
7	Action lever	Carbon steel
8	Fulcrum pin	Carbon tool steel
9	Pres-fit pin	Carbon tool steel
10	Pres-fit pin	Carbon tool steel
11	Snap ring for hole	Carbon tool steel
12	Hexagon head bolt	Carbon steel
13	Spring	Piano wire
14	Bearing	Stainless steel
15	Knuckle	Stainless steel
16	Packing	NBR
17	Packing	NBR
18	O-ring	NBR

DIMENSIONS

GPCL-8C・A

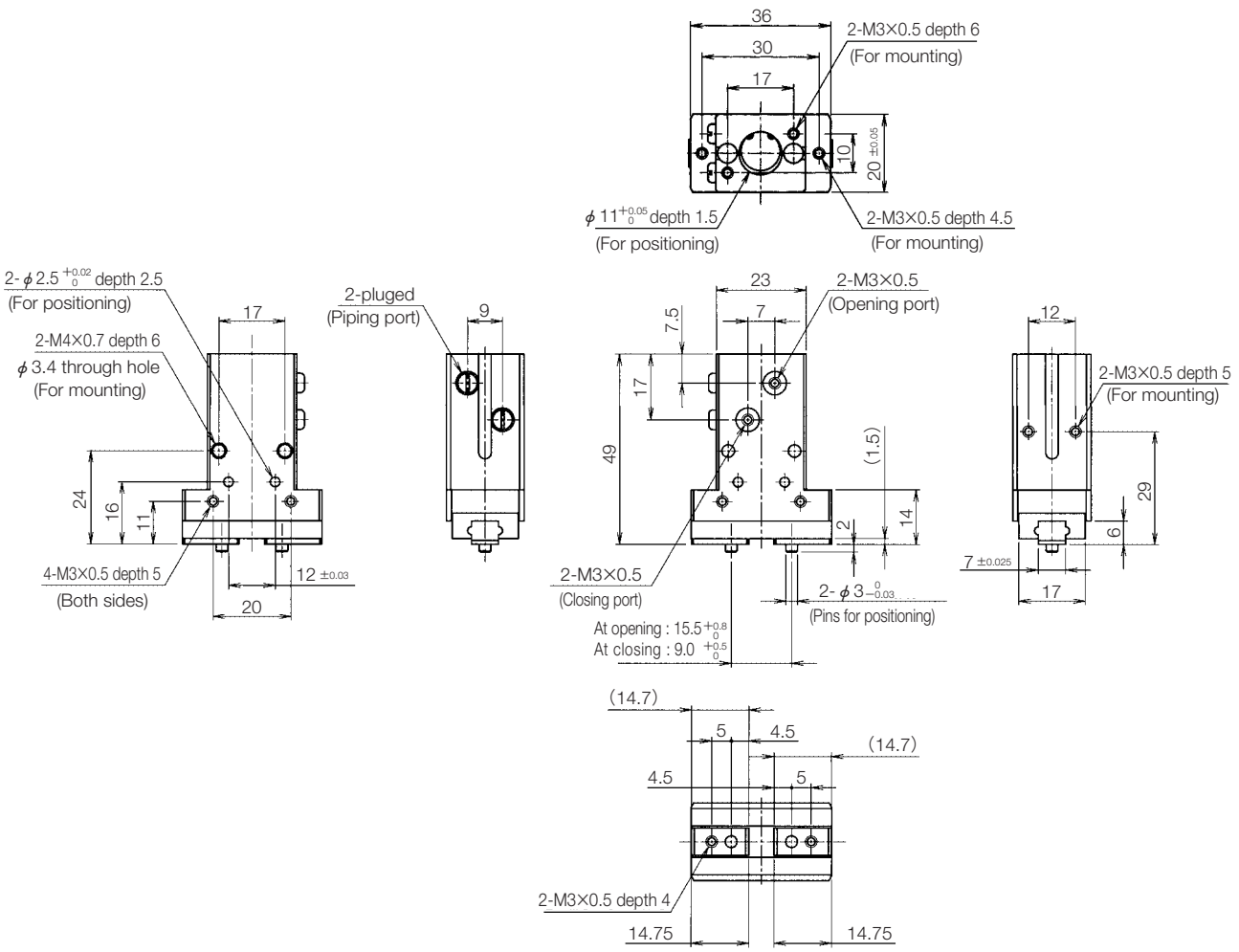
(Unit : mm)



DIMENSIONS

GPCL-10C・A

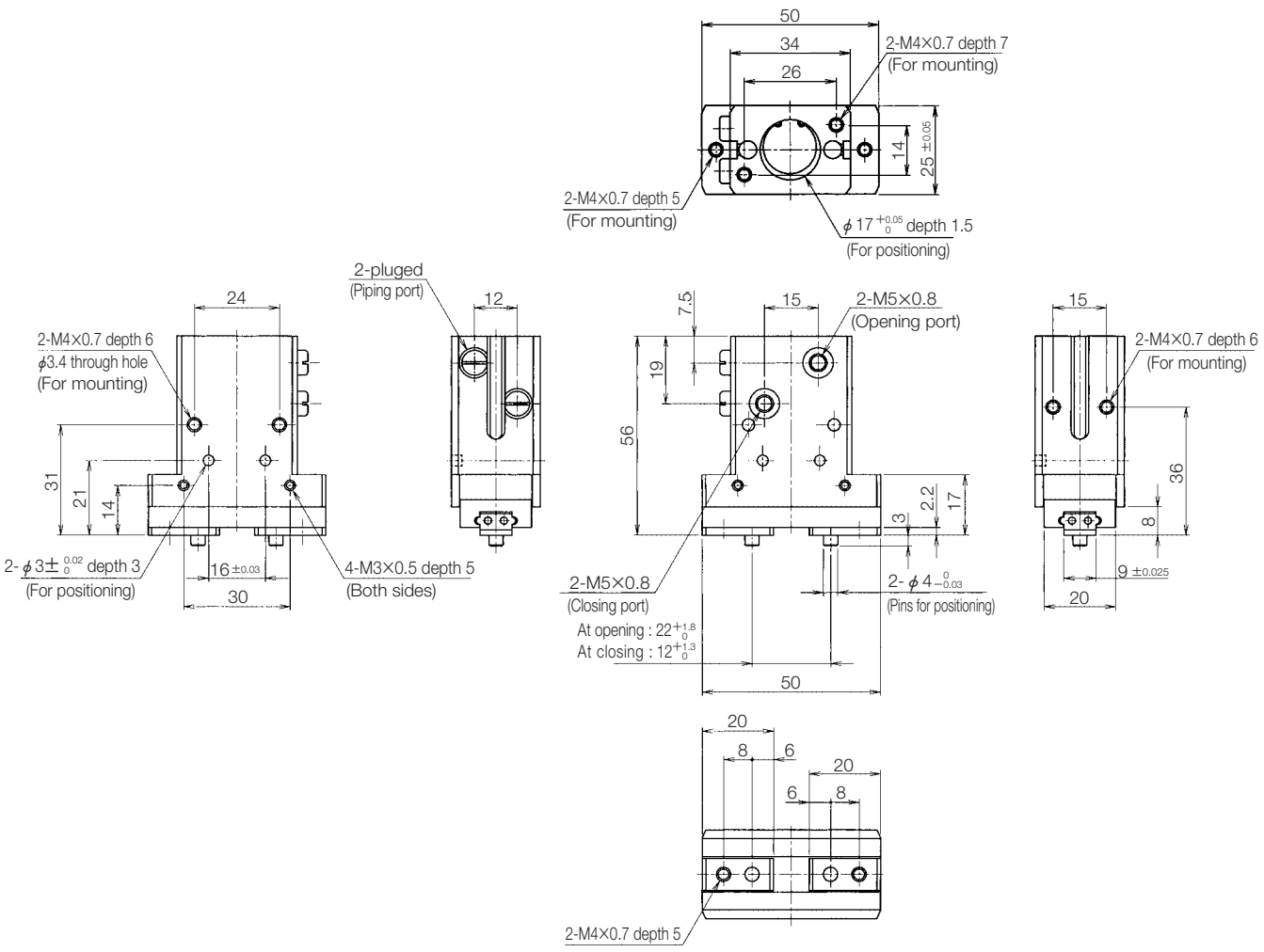
(Unit : mm)



DIMENSIONS

GPCL-16C・A

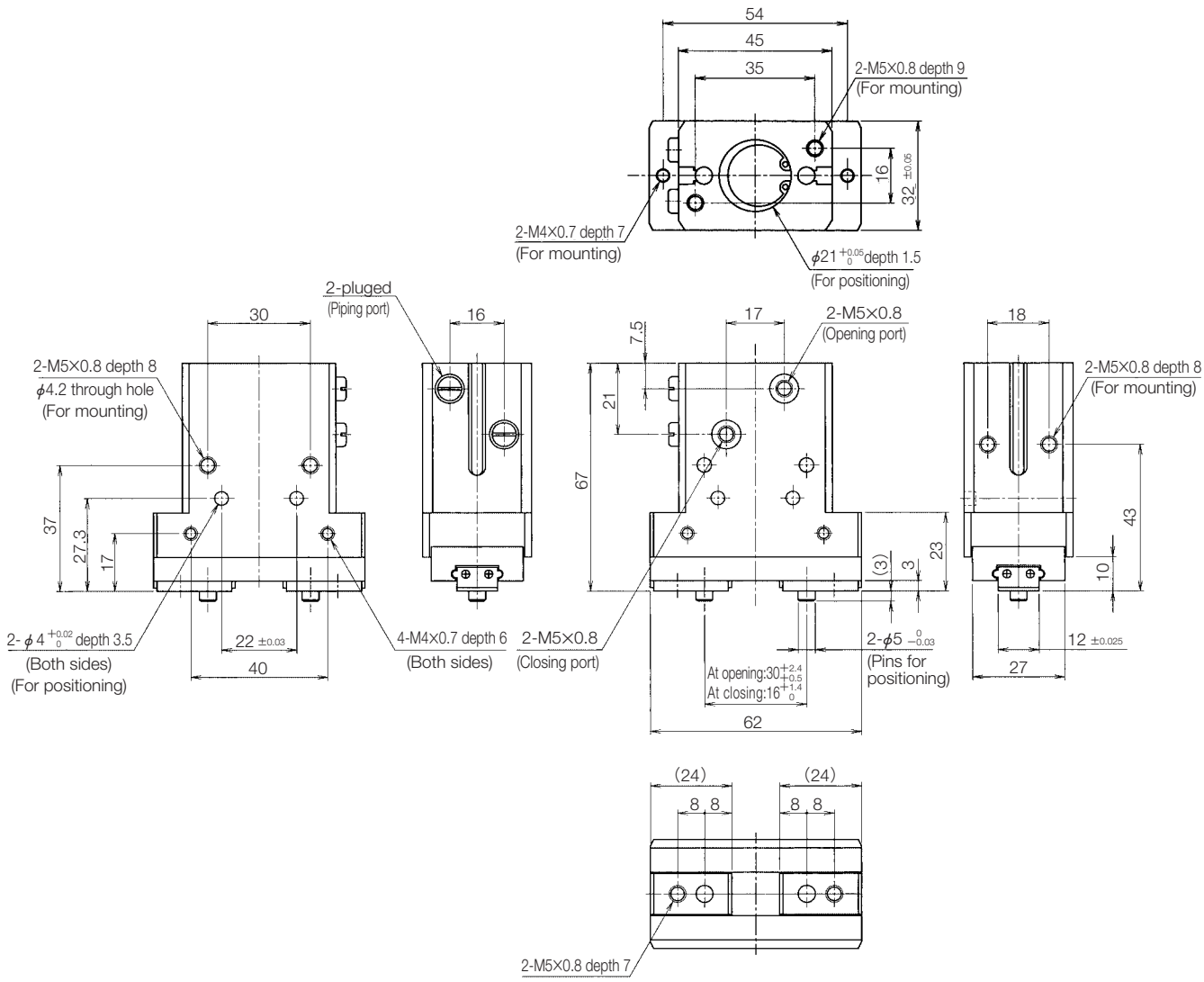
(Unit : mm)



DIMENSIONS

GPCL-20C・A

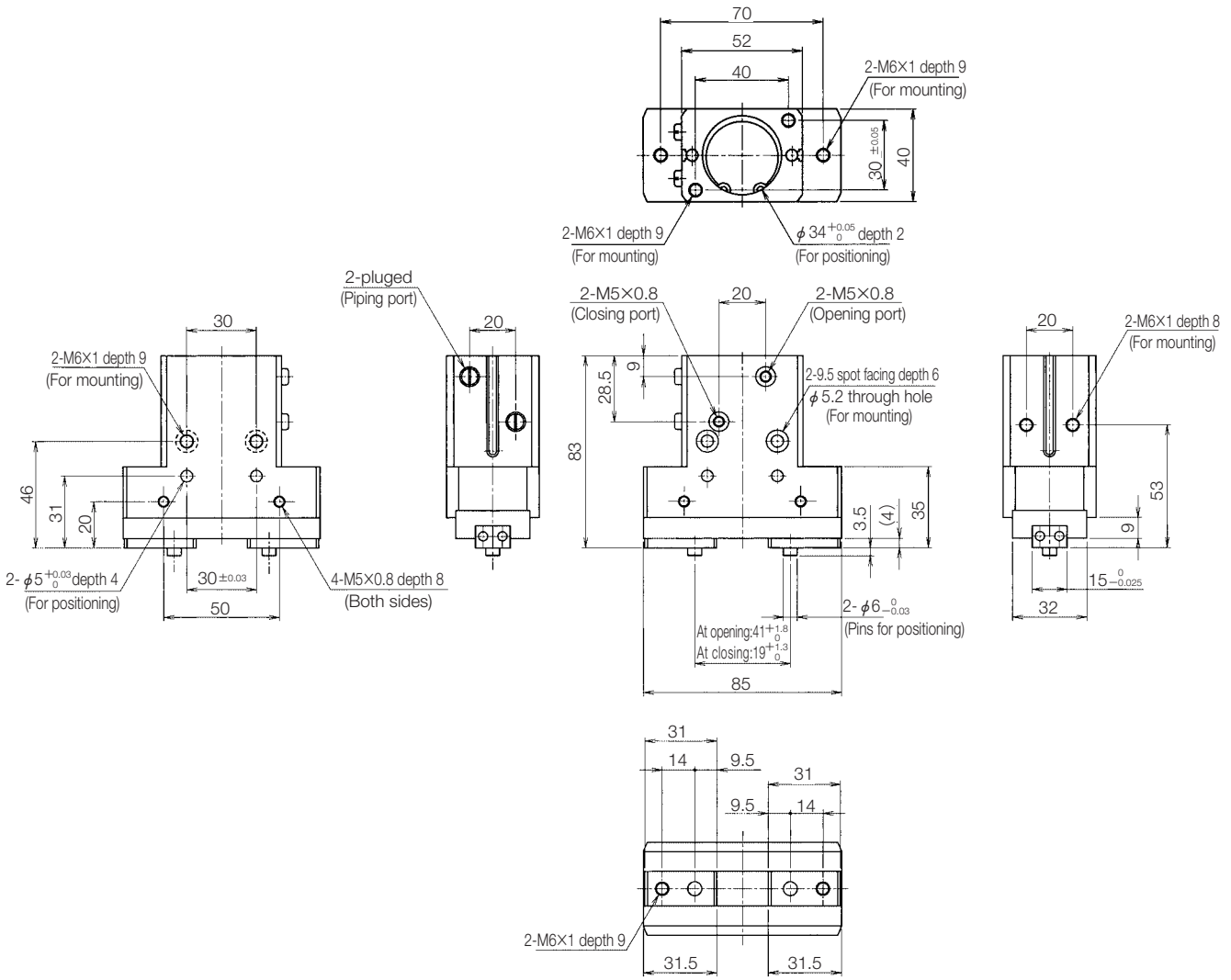
(Unit : mm)



DIMENSIONS

GPCL-32C

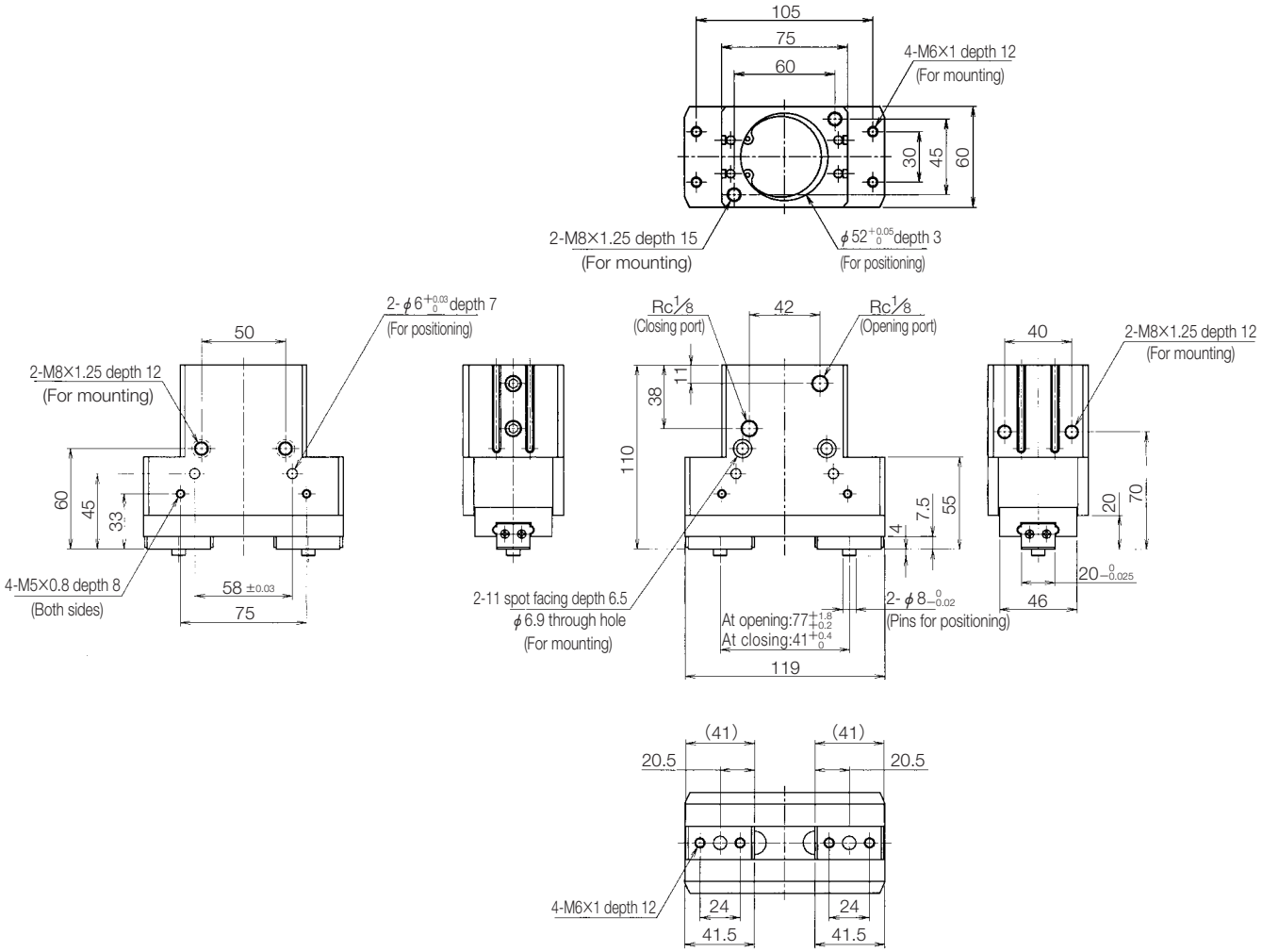
(Unit : mm)



DIMENSIONS

GPCL-50C

(Unit : mm)

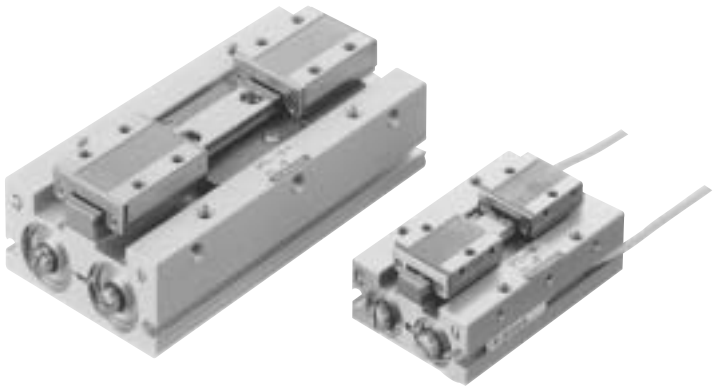


CYLINDER-DRIVEN PNEUMATIC GRIPPER

GPDL Series

EXTREMELY THIN PARALLEL GIPPER WITH LINEAR GUIDE

- **Extremely thin body**
  Making the cylinder horizontal has realized the lightweight and extremely thin body.
- **High degree of gripping accuracy and rigidity**
  Use of a linear guide in the finger results in high degree of gripping accuracy and rigidity.
- **High gripping force**
  High gripping force owing to a double piston system.
- **Adjustable stroke**
  Adjustable stroke in both opening and closing directions.
- **Two switches available as attachment**
  This series can be equipped with 2 switches to check that finger opens and closes. The switch is fitted into the groove provided on the side of the gripper body.
- **Gripper body can be installed to turn to any of 3 directions.**



SPECIFICATIONS

Model No.	Unit	GPDL-8	GPDL-8JA	GPDL-8JB	GPDL-8JC	GPDL-12	GPDL-12JA	GPDL-12JB	GPDL-12JC
Cylinder ID	mm	8				12			
Operating method		Double acting type							
Fluid		Non-lubricated air							
Operating pressure range	MPa	0.2～0.7				0.15～0.7			
Operating ambient temperature	℃	5～60							
Port size		M3×0.5				M5×0.8			
Maximum stroke	mm	16				22			
Direction of adjustment & width	mm	—	Opening:8 max.	Closing:8 max.	Opening/ closing:8 max.	—	Opening:8 max.	Closing:8 max.	Opening/ closing:8 max.
Gripping force	N	16.7				44			
Mass	g	74	85	85	75	183	195	195	186

Model No.	Unit	GPDL-14		GPDL-14JA		GPDL-14JB		GPDL-14JC		GPDL-18		GPDL-18JA		GPDL-18JB		GPDL-18JC	
		S	L	S	L	S	L	S	L	S	L	S	L	S	L	S	L
Cylinder ID	mm	14								18							
Operating method		Double acting type															
Fluid		Non-lubricated air															
Operating pressure range	MPa	0.15～0.7															
Operating ambient temperature	℃	5～60															
Port size		M5×0.8															
Maximum stroke	mm	30	60	30	60	30	60	30	60	40	80	40	80	40	80	40	80
Direction of adjustment & width	mm	—		Opening:15 max.		Closing15 max.		Opening/ closing15 max.		—		Opening:15 max.		Closing15 max.		Opening/ closing15 max.	
Gripping force	N	58.8								107.8							
Mass	g	430	570	440	580	440	580	405	590	640	940	650	950	650	950	710	1040

(Note) • Gripping force is the value at 0.5 MPa and L (length to grip point)=30 mm.
• When using it at temperature of 5 ℃ or below, use dry air that has passed through an air dryer to prevent condensation, freeze, etc.

ORDERING INSTRUCTIONS

GPDL	-	14	JA	-	S	-	ZE135	A	2
①		②	③		④		⑤	⑥	⑦

①Model No.

②Cylinder ID

8	φ8
12	φ12
14	φ14
18	φ18

③Operating method

No mark	Double acting type without stroke adjustment
JA	Double acting type with opening direction stroke adjustment
JB	Double acting type with closing direction stroke adjustment
JC	Double acting type with opening/closing direction stroke adjustment

④Stroke

Stroke for φ8 and φ12 are omitted.

S	Short type
L	Long type

⑤Switch

No mark	No switch	
ZE135	DC10～28V	2-wire proximity switch
ZE235	DC4.5～28V	
ZE155	DC10～28V	3-wire proximity switch
ZE255	DC4.5～28V	

⑥Switch lead length

No mark	No switch
A	1m
B	3m

⑦Number of switch

No mark	No switch
1	With 1 switch
2	With 2 switches

Parallel Gripper with Switch

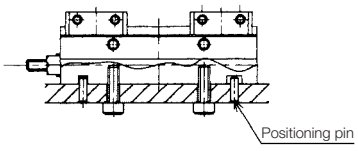
ZE type proximity switch

Lead wire type

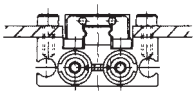
Model No. of sitch		Load voltage (V)	Load current (mA)	Indicator lamp (Lights up at ON.)	Applications
2-wire type	ZE135	DC10～28	4～20	Red LED	Relay PLC IC circut
	ZE235				
3-wire type	ZE155	DC4.5～28	max. 50		
	ZE255				

EXAMPLE OF MOUNTING

Mounting with set screw on bottm of body

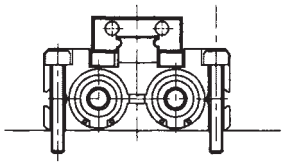


Mounting with set screw on side of finger of body

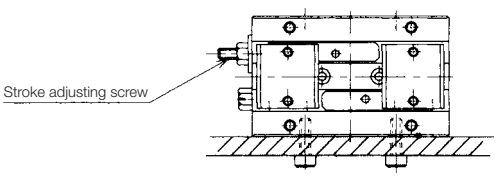


Mounting with through hole on body (Made to order)

(Switch can be fitted to ZE235 and ZE255.)



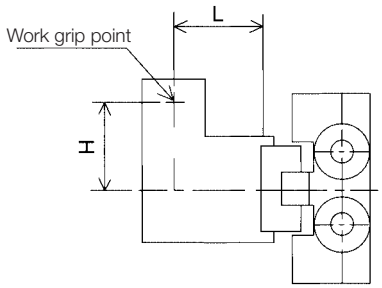
Mounting with set screws on side of body



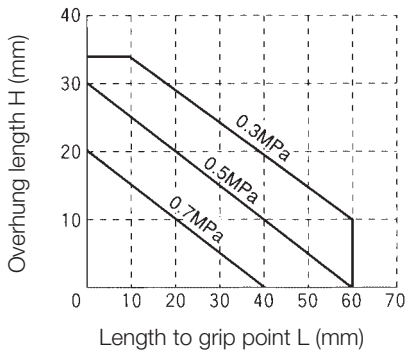
LIMITING RANGE AT GRIP POINT

⚠ CAUTION

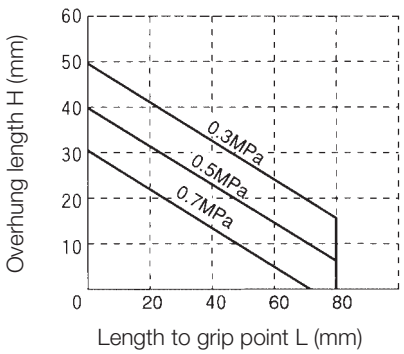
- Set length to grip point L and overhung length H for the attachment fitted to the finger to come within the limiting range shown in Fig. below :
  If they are set outside the limiting range, excessively large moment is applied to the finger and guide, thus adversely affecting the life and accuracy of the gripper.
- Even if the attachment is set within the range shown in Fig. below, make it small and light as much as possible.



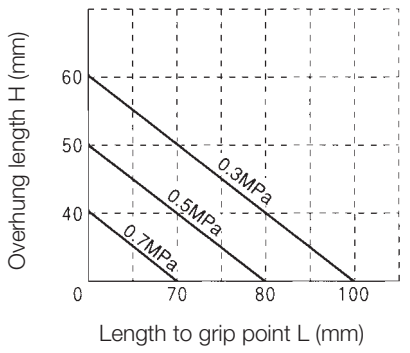
GPDL-8



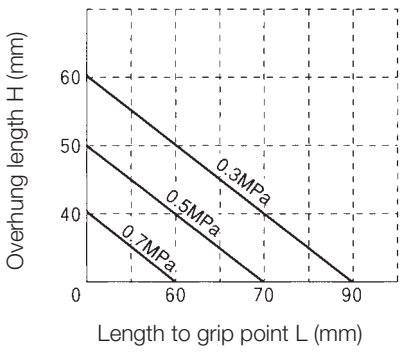
GPDL-12



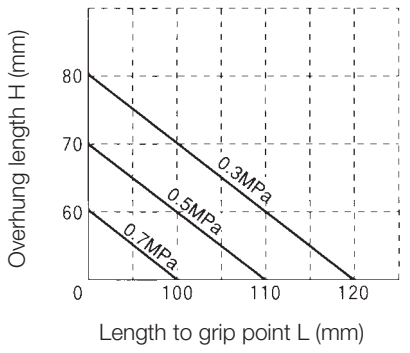
GPDL-14-S



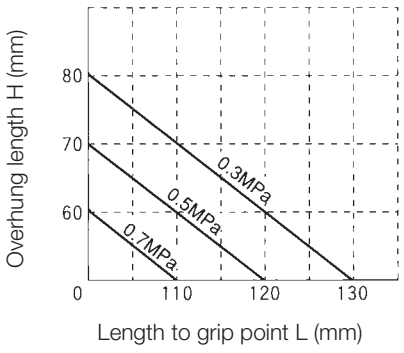
GPDL-14-L



GPDL-18-S



GPDL-18-L



HOW TO SEARCH FOR GRIPPING FORCE

Read gripping force that satisfies the following conditions from Fig. below :

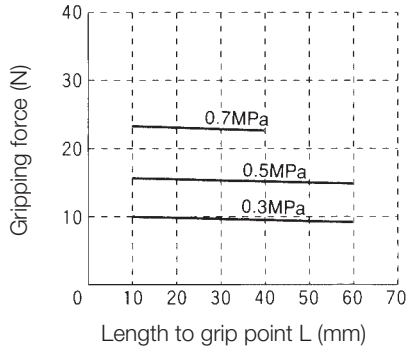
- Set the work gripping force at 10 to 20 times as much as work load.
- Set the gripping force at the time of moving the gripper with work gripped at 30 to 50 times as much as work load. It is required to prevent the jumping out and dropping of work while the gripper is moving.

⚠ CAUTION

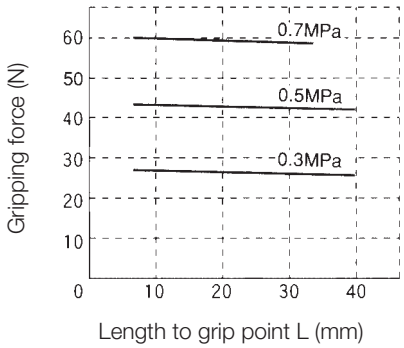
- Set gripping force by referring to the following guide value. In this case, take into account an allowance as much as possible.
- If great acceleration or impact is applied when carrying work, gripping force over the following guide value will be needed.

AVERAGE GRIPPING FORCE (Effective value)

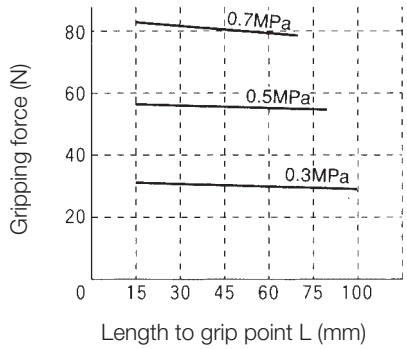
GPDL-8



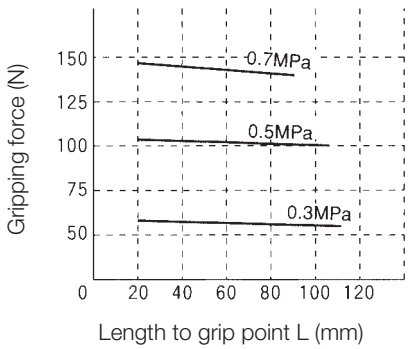
GPDL-12



GPDL-14-S·L



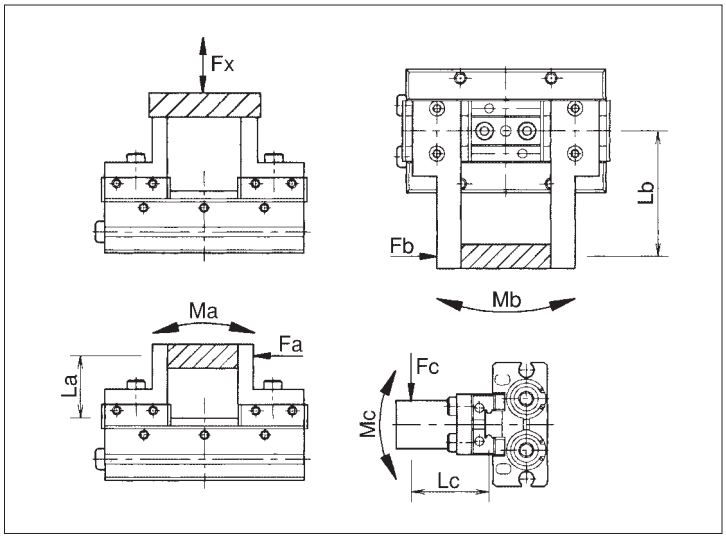
GPDL-18-S·L



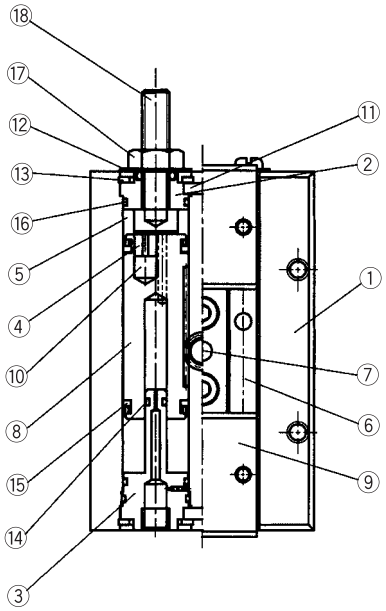
ALLOWABLE LOAD AND ALLOWABLE MOMENT

Model No.	Fx (N)	Ma (N·m)	Mb (N·m)	Mc (N·m)
GPDL-8	40	0.3	0.3	0.5
GPCL-10	120	1.0	1.0	2.0
GPDL-14	190	3.4	4.0	8.0
GPDL-18	210	4.4	5.4	9.0

Ma=Fa×La
Mb=Fb×Lb
Mc=Fc×Lc



CONSTRUCTIONS AND MAIN PARTS



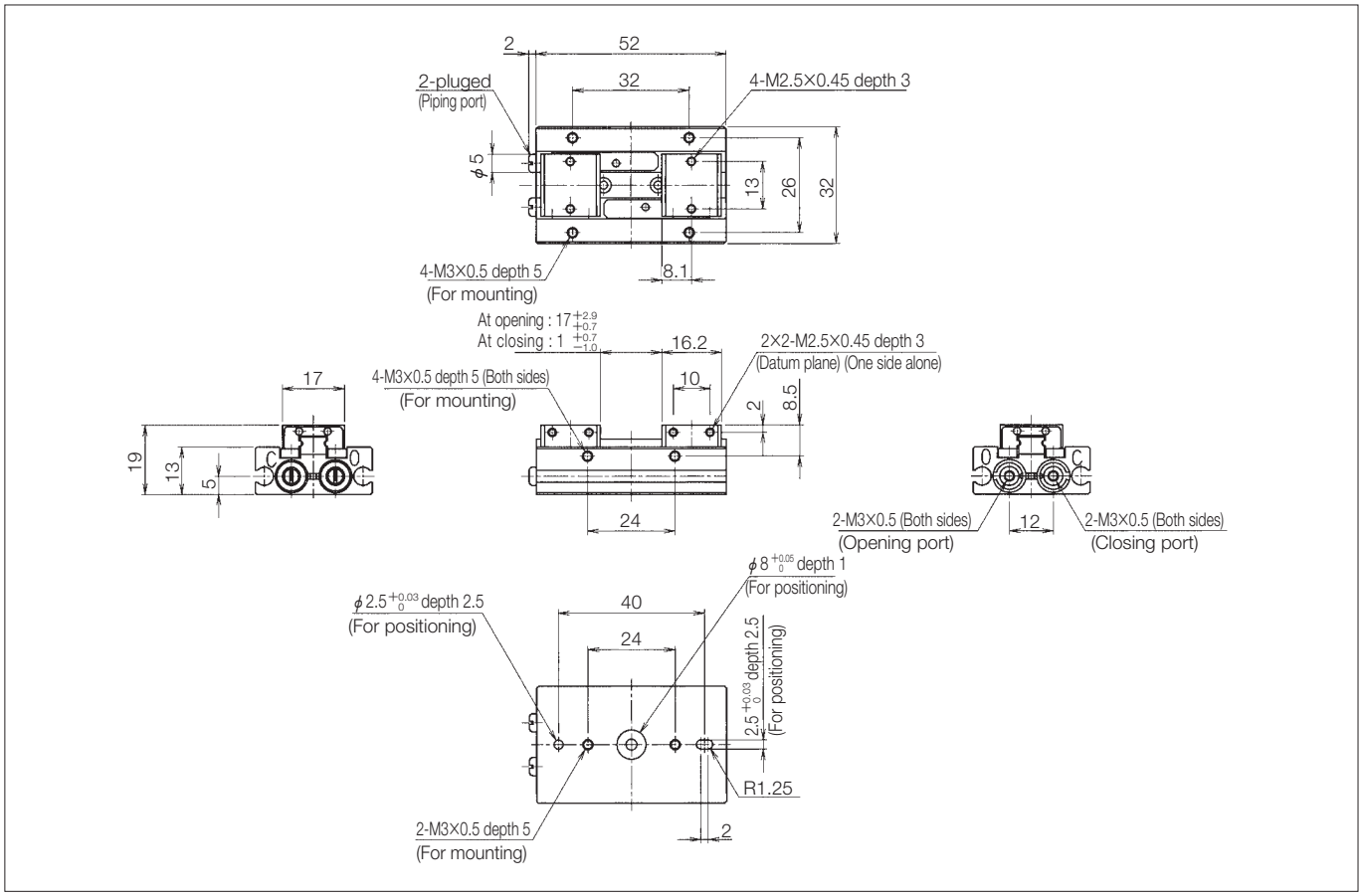
No.	Description	Material
1	Body	Aluminium alloy
2	Head cover	Aluminium alloy
3	Head cover	Aluminium alloy
4	Hold-down cover	Aluminium alloy
5	Hold-down cover	Aluminium alloy
6	Lever	Carbon steel
7	Pinion	Stainless steel
8	Rack piston	Stainless steel
9	Bearing	Stainless steel
10	Magnet	—
11	Roller	Carbon steel
12	Snap ring for hole	Carbon steel
13	O-ring	NBR
14	O-ring	NBR
15	Packing	NBR
16	Adjusting bolt	Carbon steel
17	Fastener seal	NBR
18	Hexagon nut	Soft steel

※5 : Hold-down cover : ϕ8 alone

DIMENSIONS

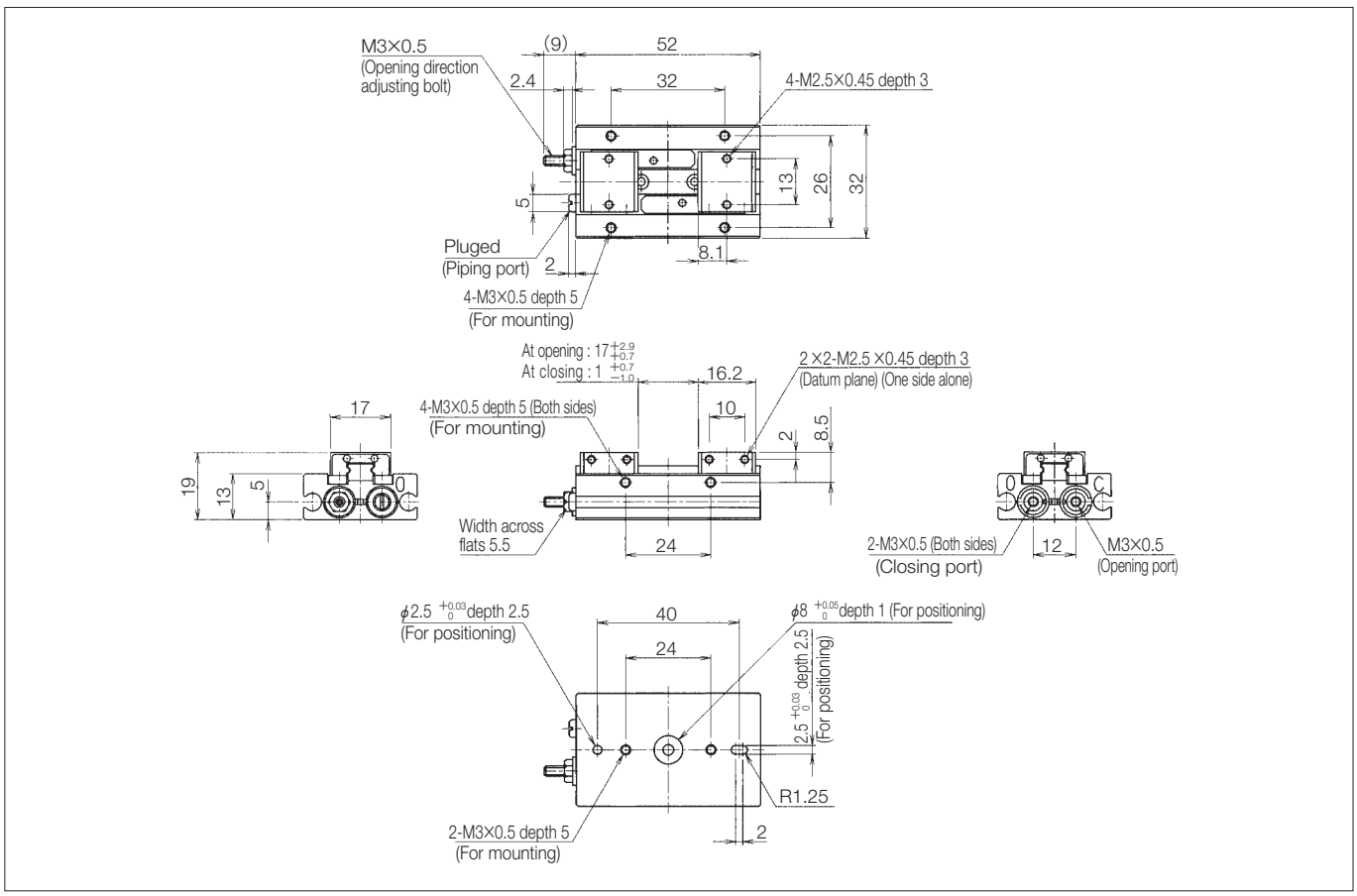
GPDL-8

(Unit : mm)



GPDL-8JA

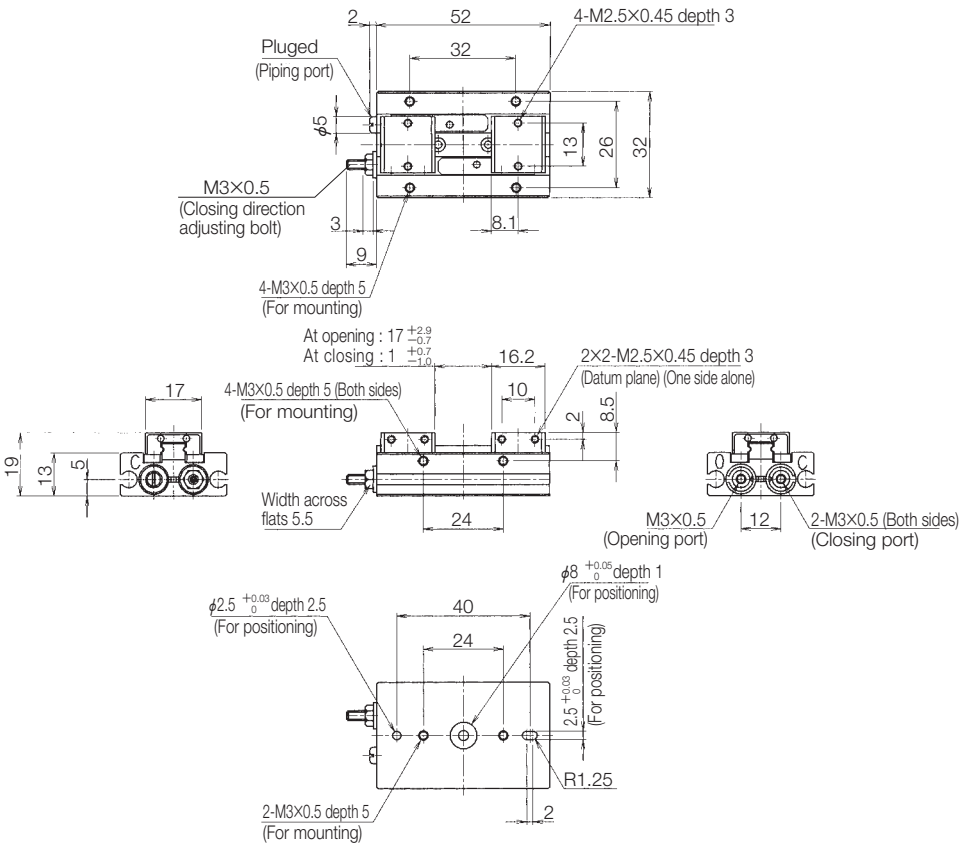
(Unit : mm)



DIMENSIONS

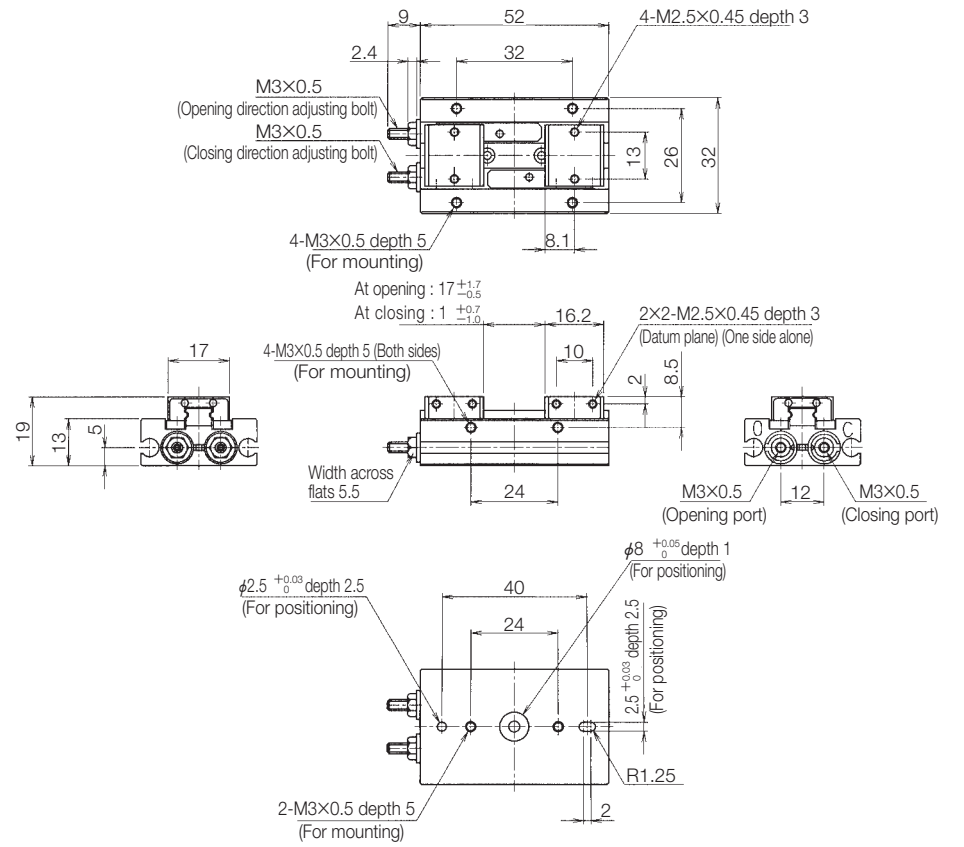
GPDL-8JB

(Unit : mm)



GPDL-8JC

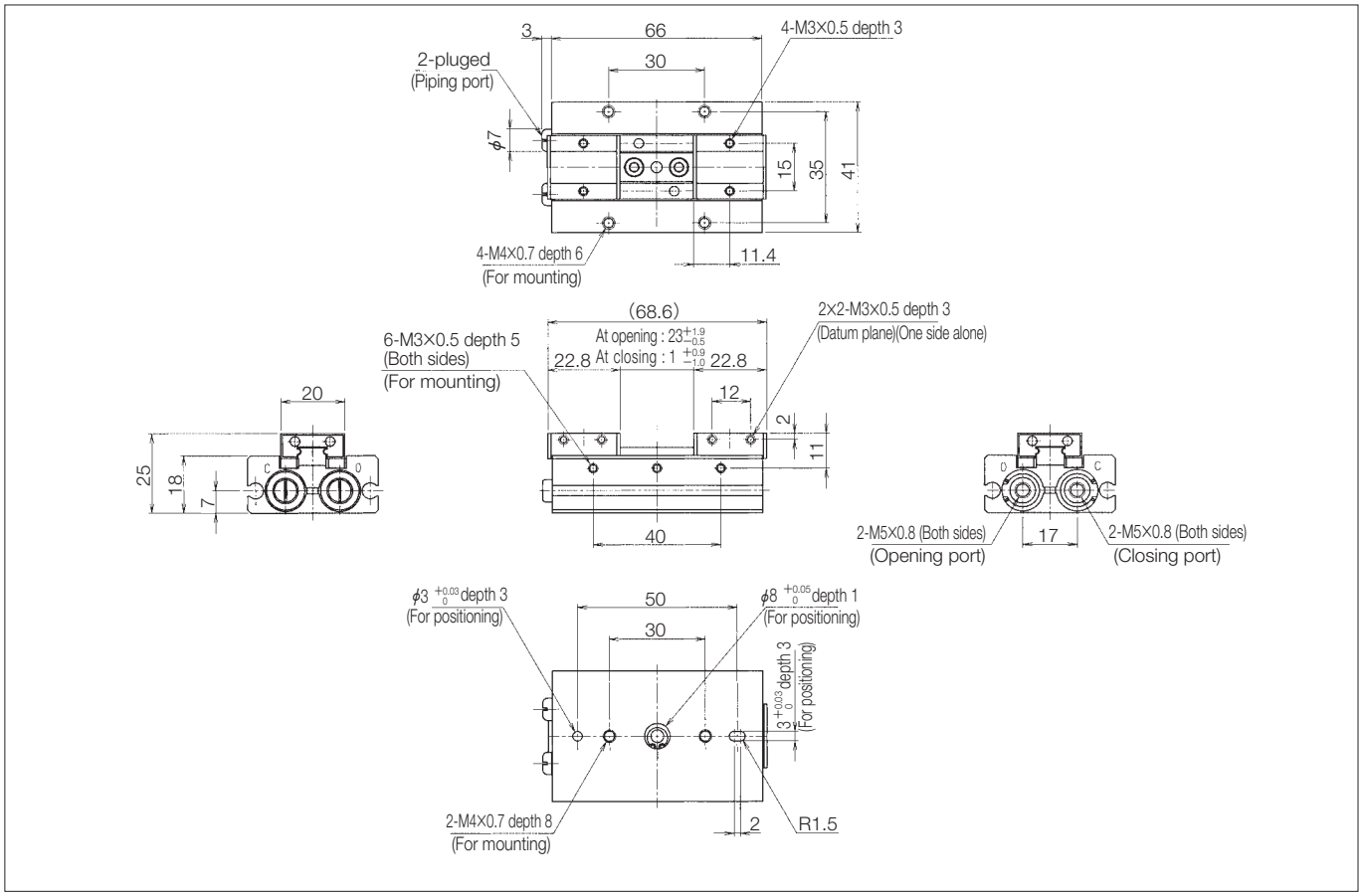
(Unit : mm)



DIMENSIONS

GPDL-12

(Unit : mm)



GPDL-12JA

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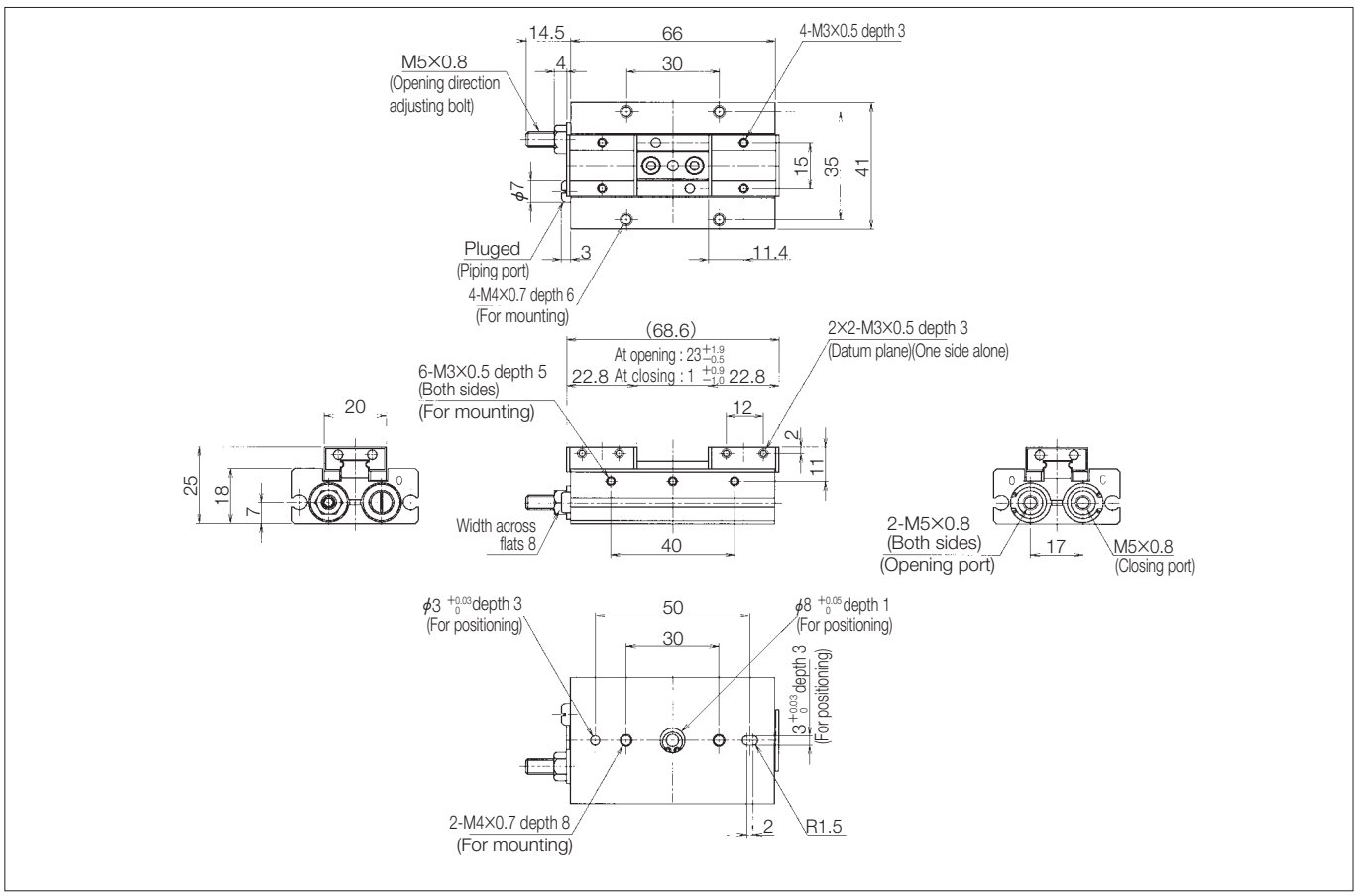
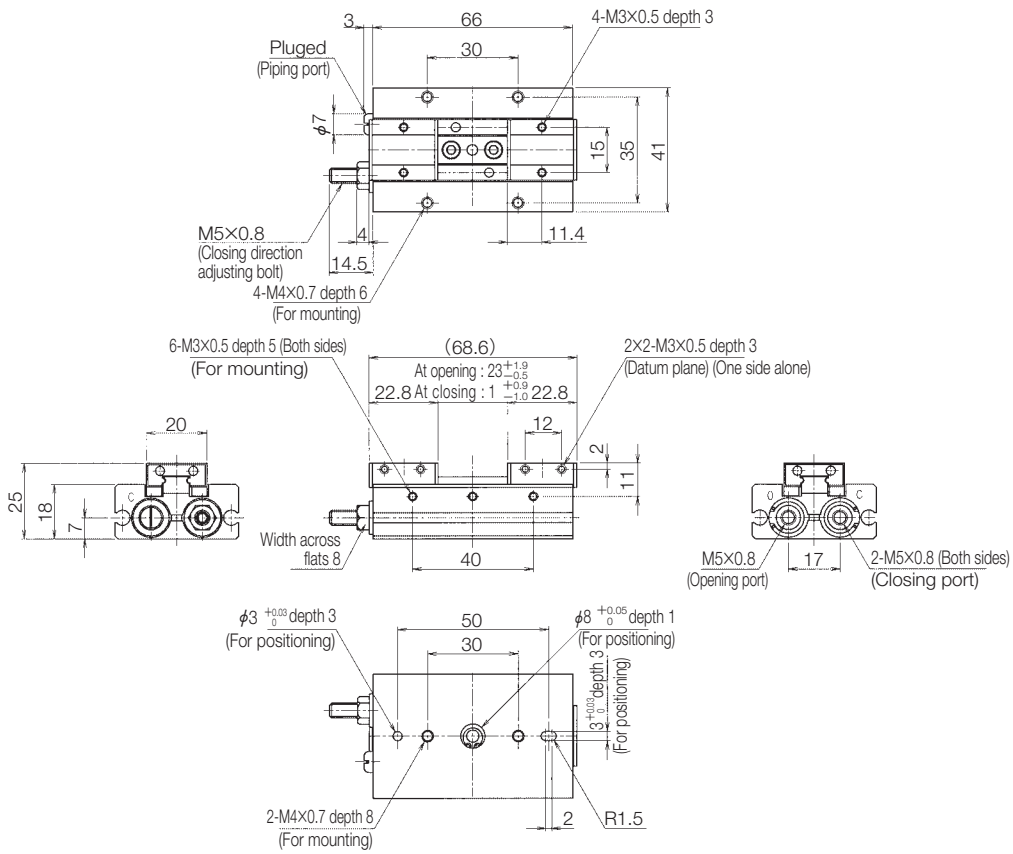


DIMENSIONS

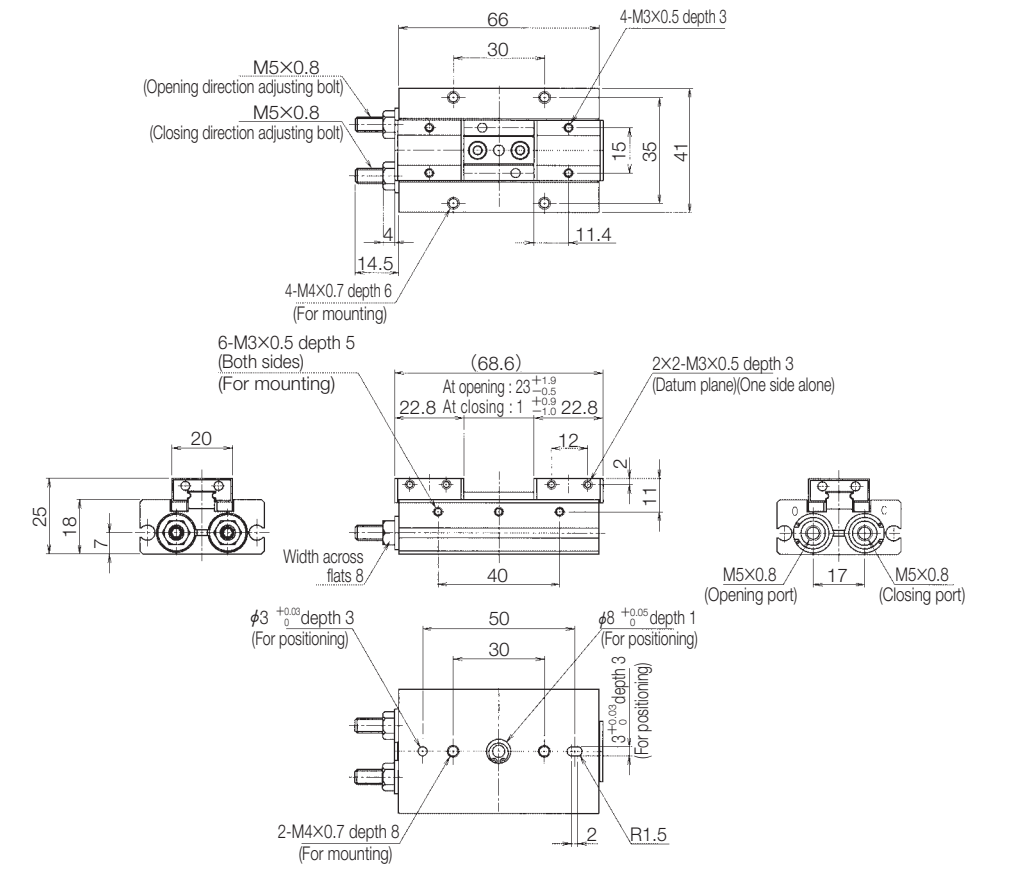
GPDL-12JB

(Unit : mm)



GPDL-12JC

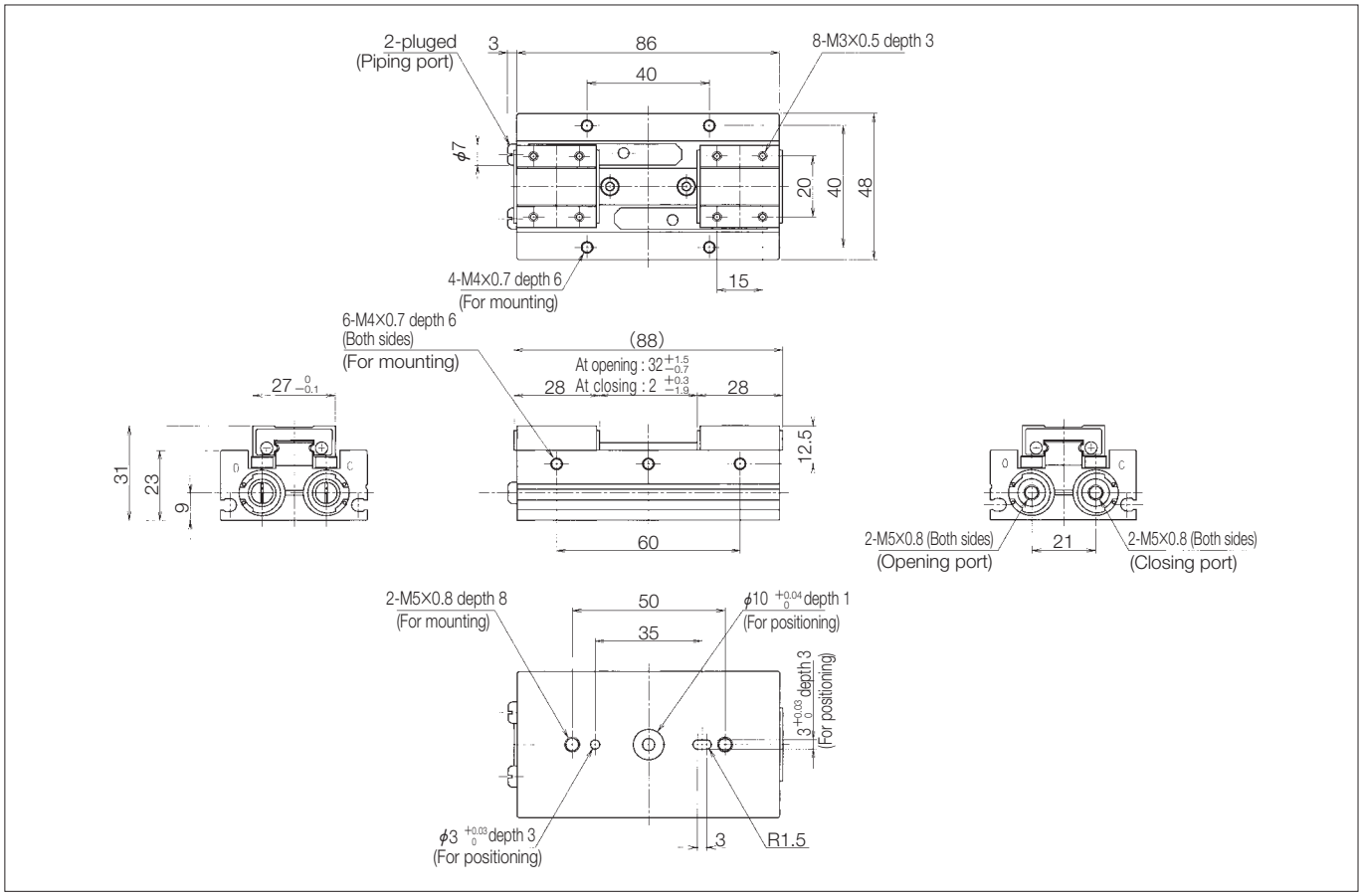
(Unit : mm)



DIMENSIONS

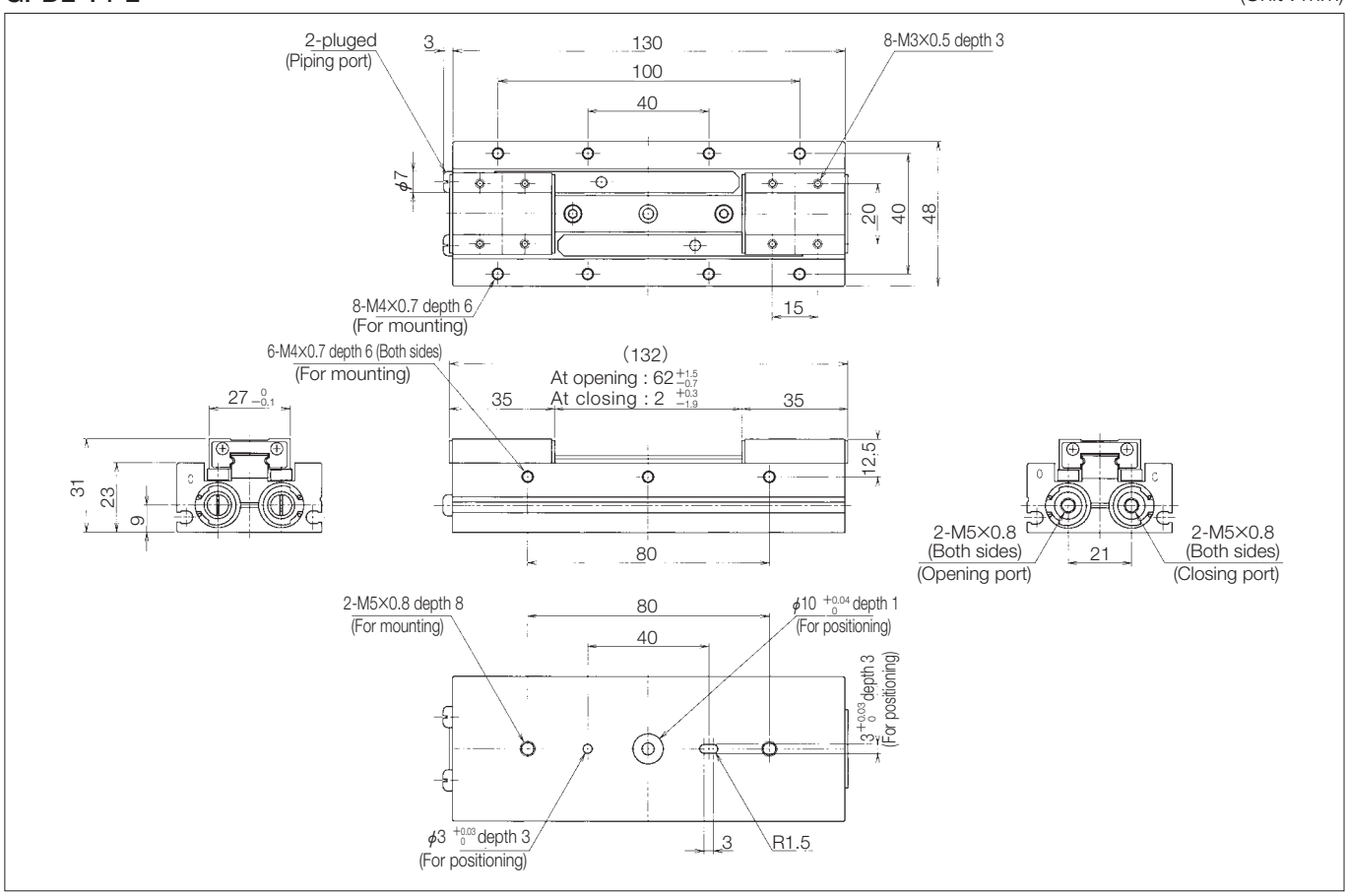
GPDL-14-S

(Unit : mm)



GPDL-14-L

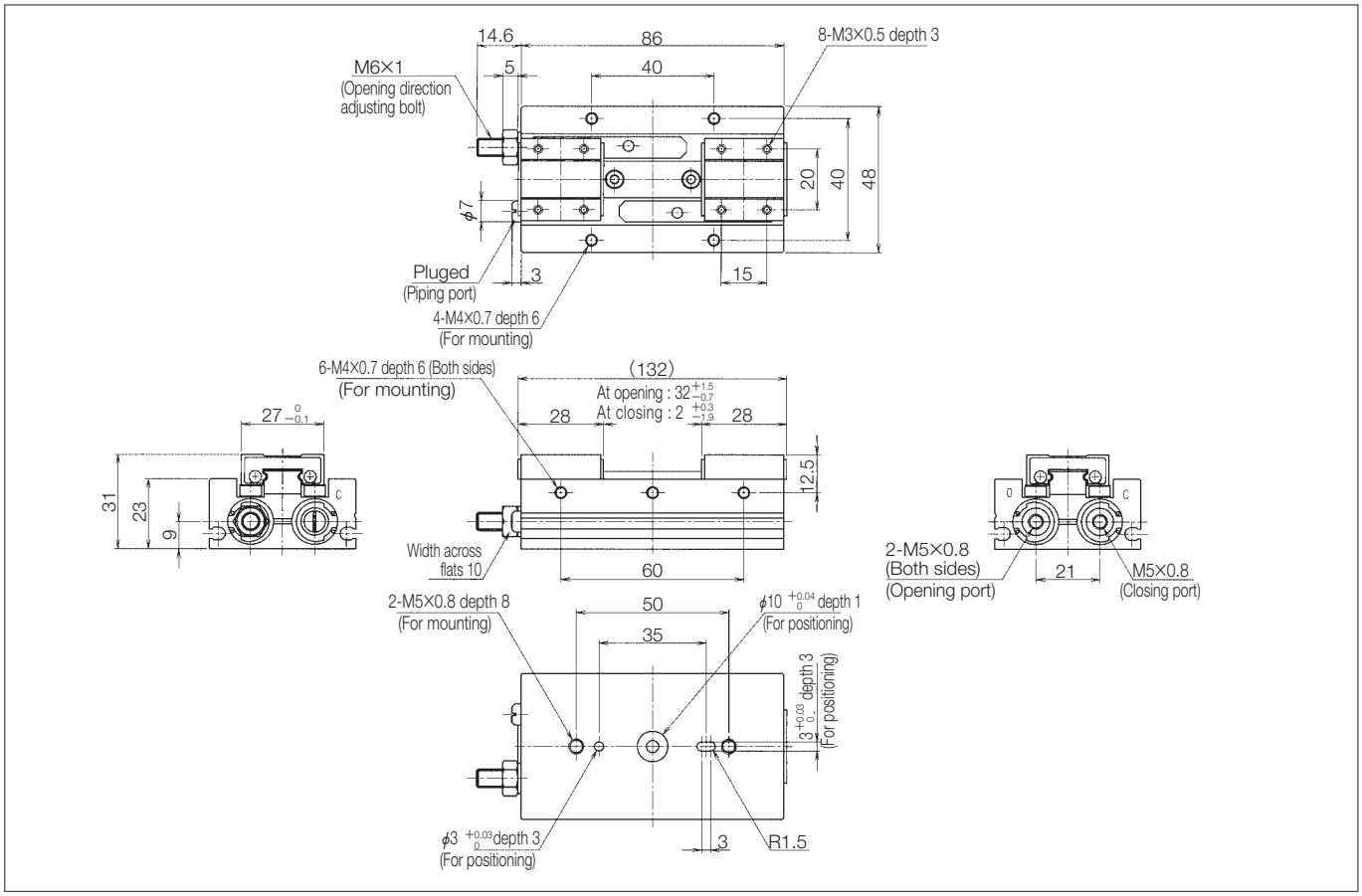
(Unit : mm)



DIMENSIONS

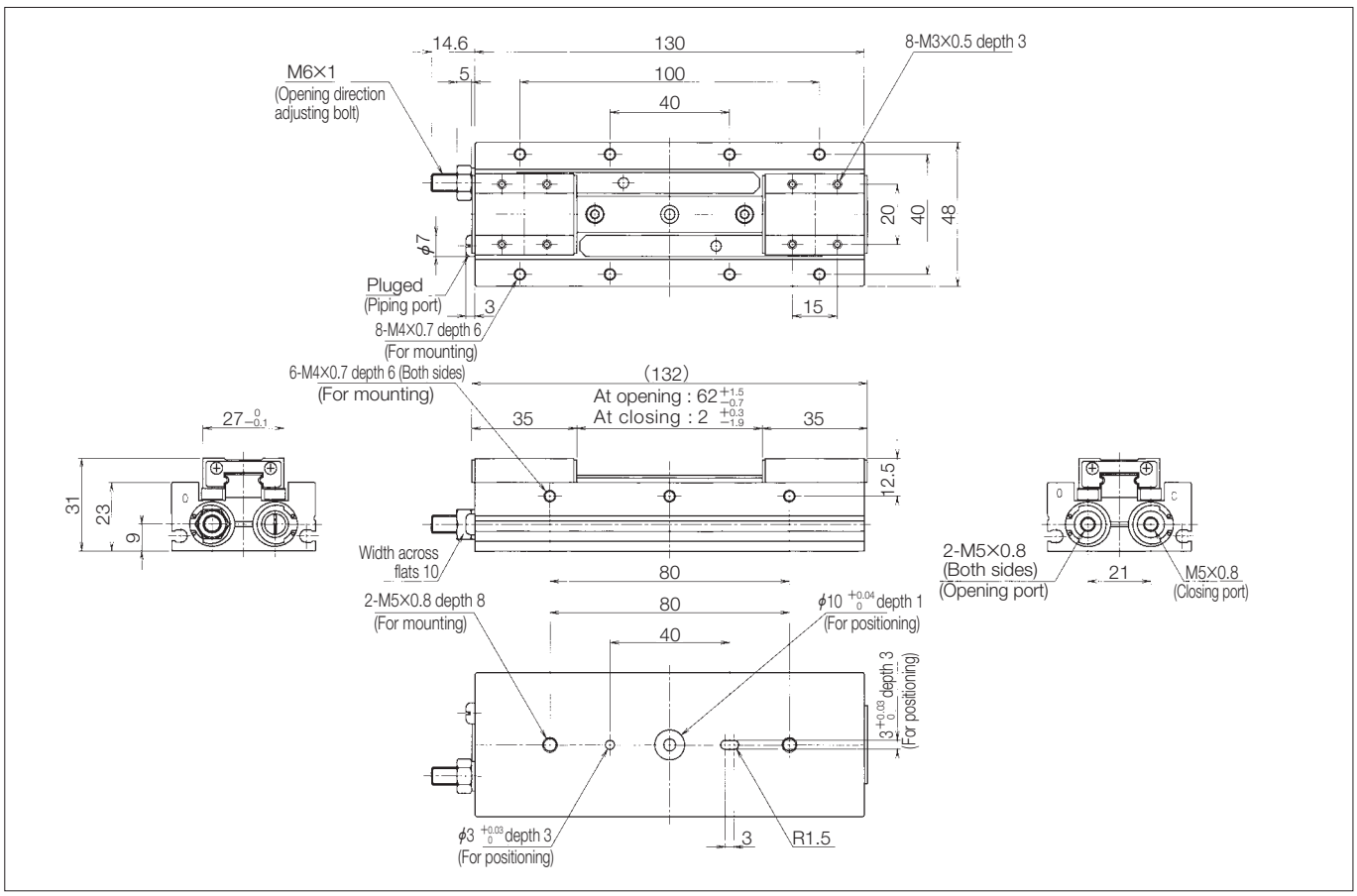
GPDL-14JA-S

(Unit : mm)



GPDL-14JA-L

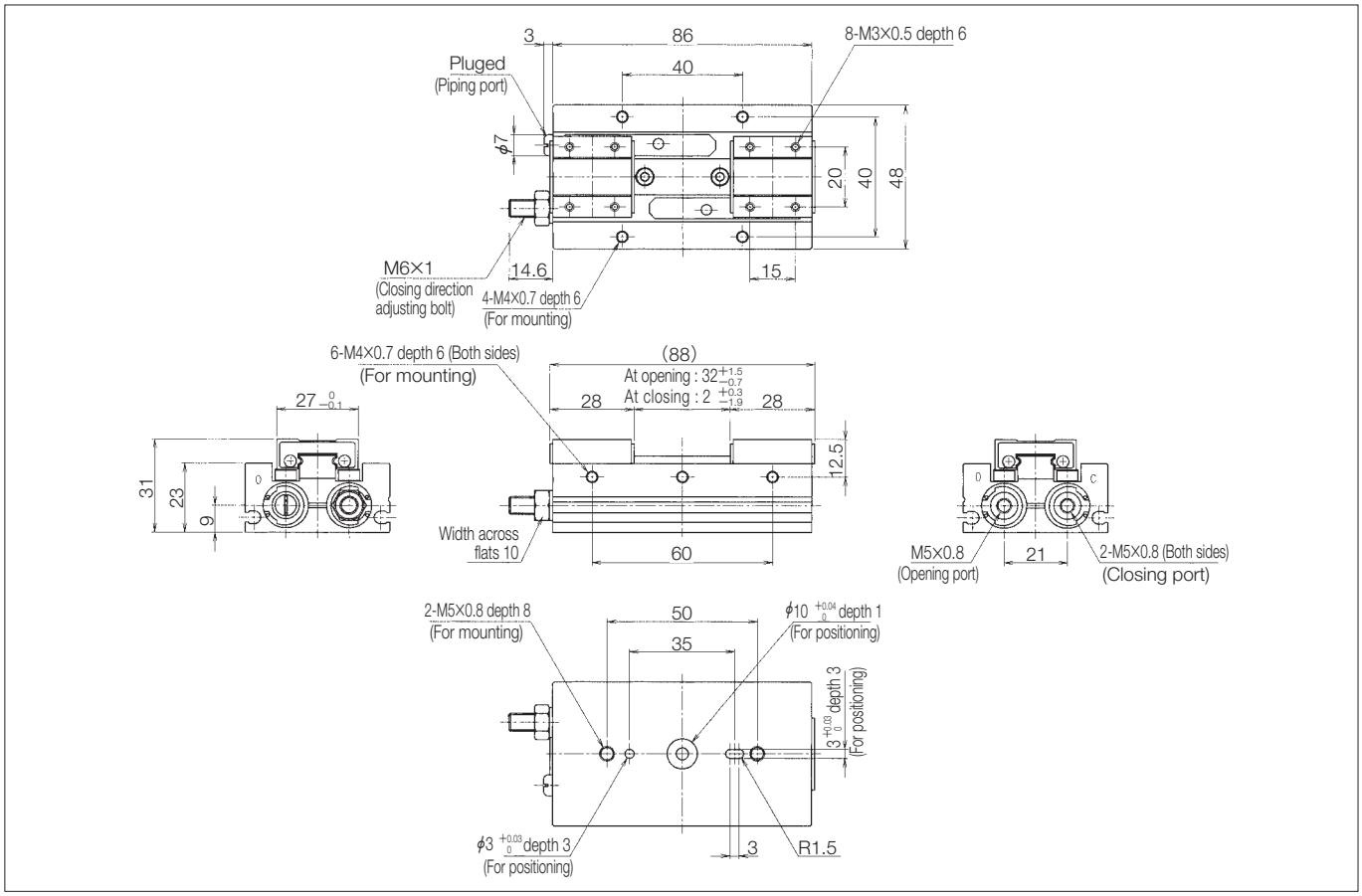
(Unit : mm)



DIMENSIONS

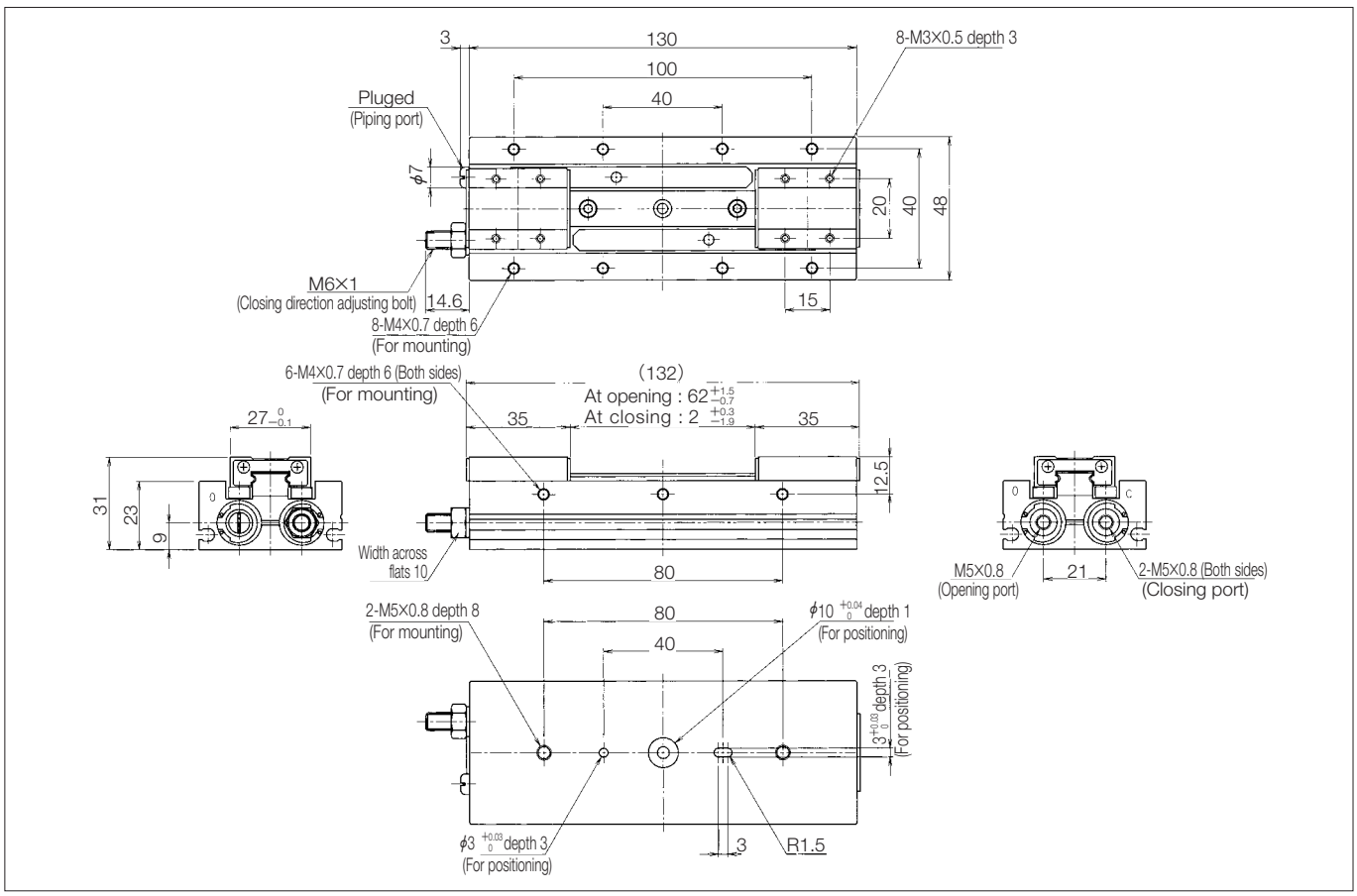
GPDL-14JB-S

(Unit : mm)



GPDL-14JB-L

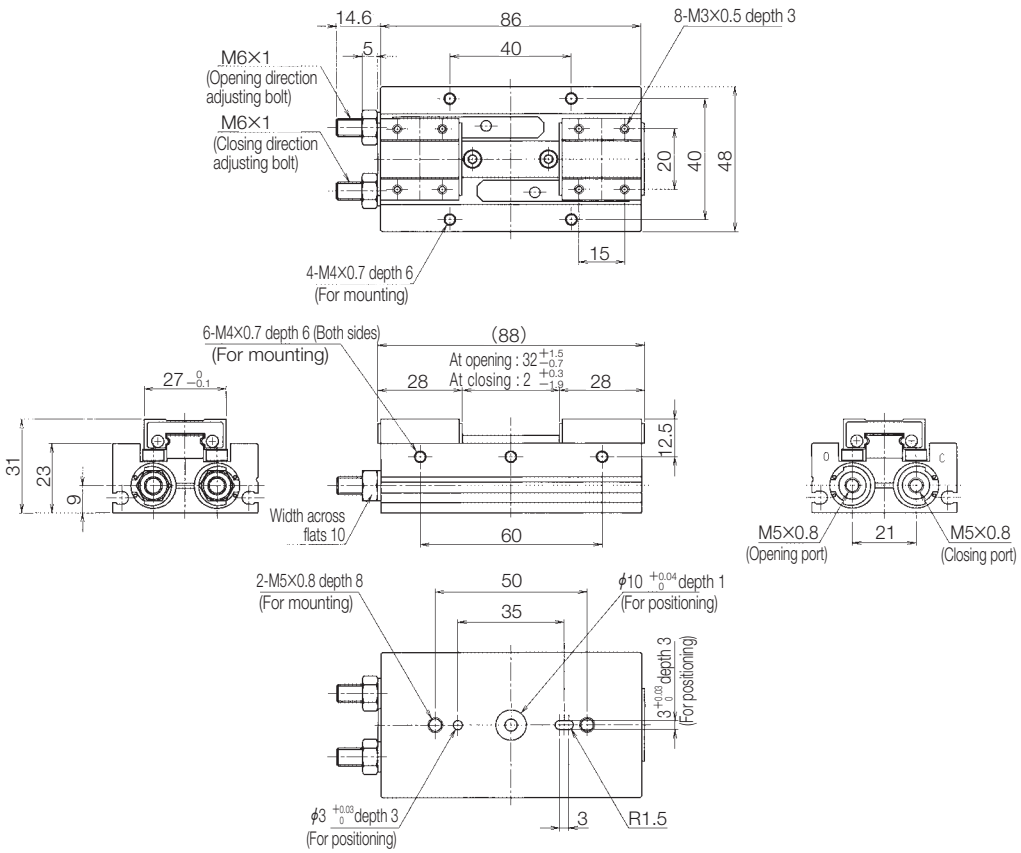
(Unit : mm)



DIMENSIONS

GPDL-14JC-S

(Unit : mm)



GPDL-14JC-L

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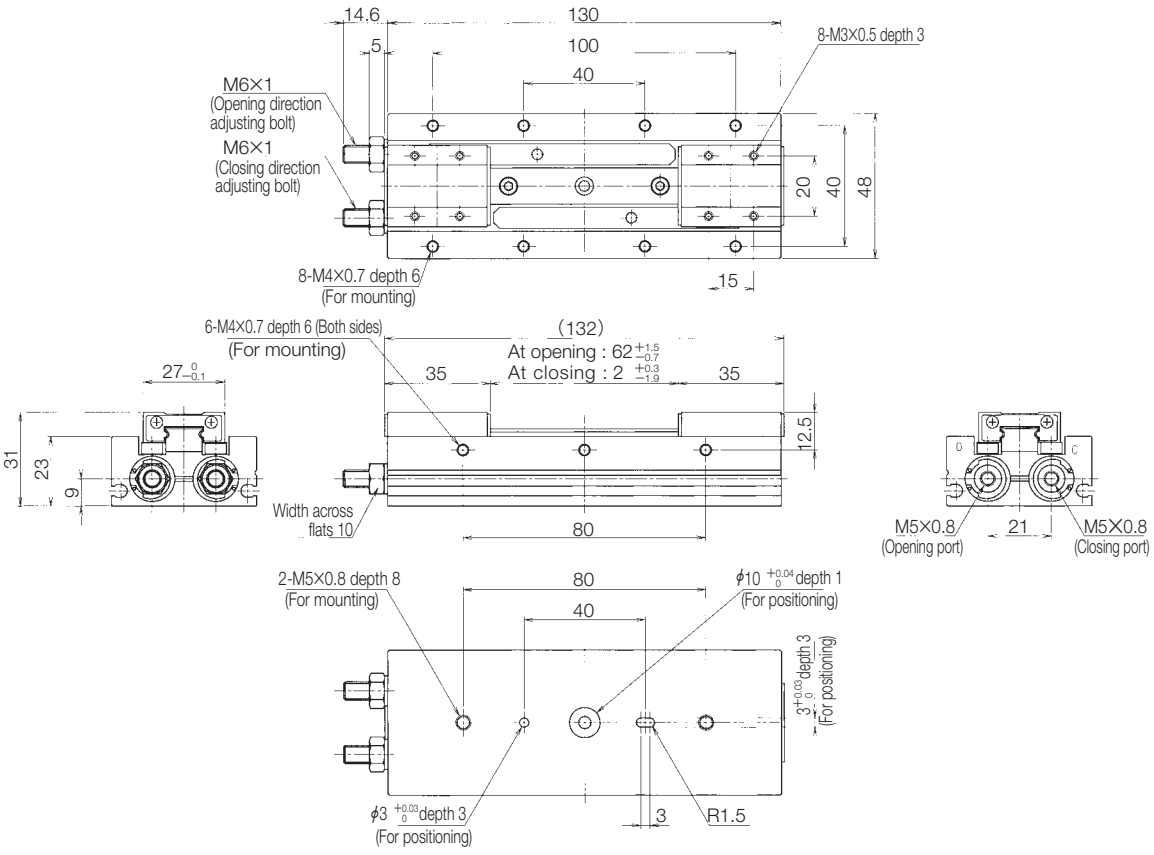
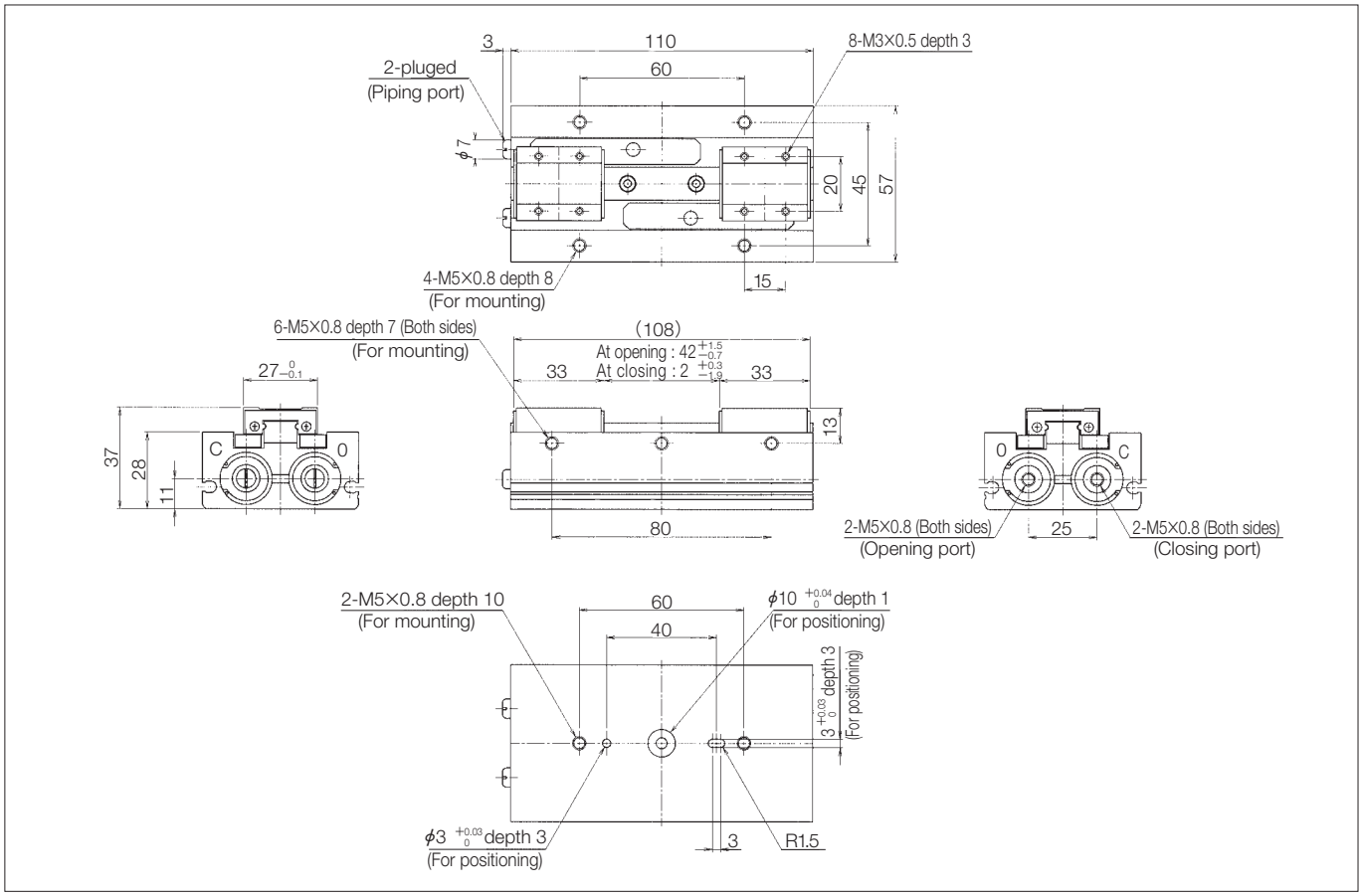


DIMENSIONS

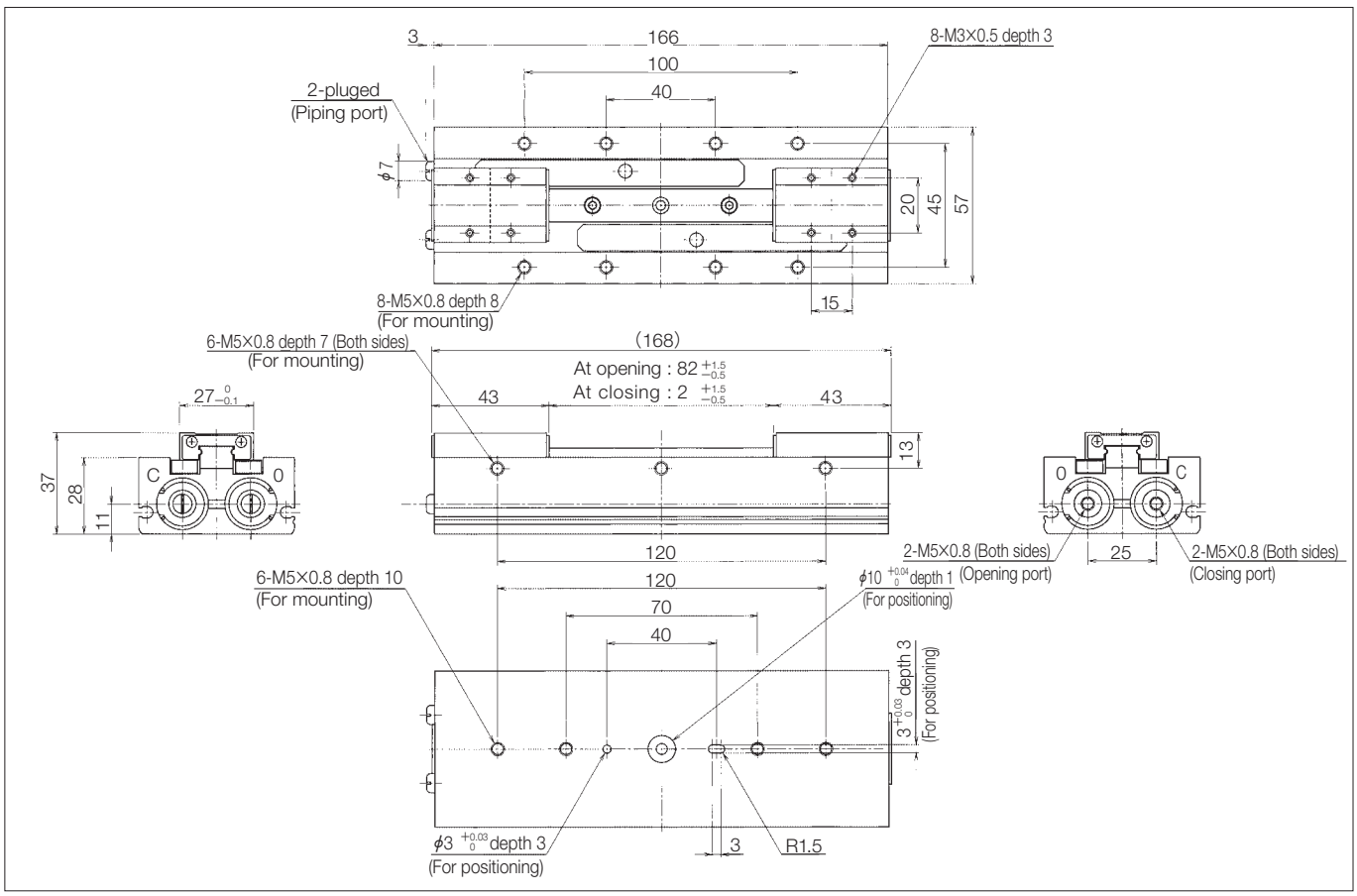
GPDL-18-S

(Unit : mm)



GPDL-18-L

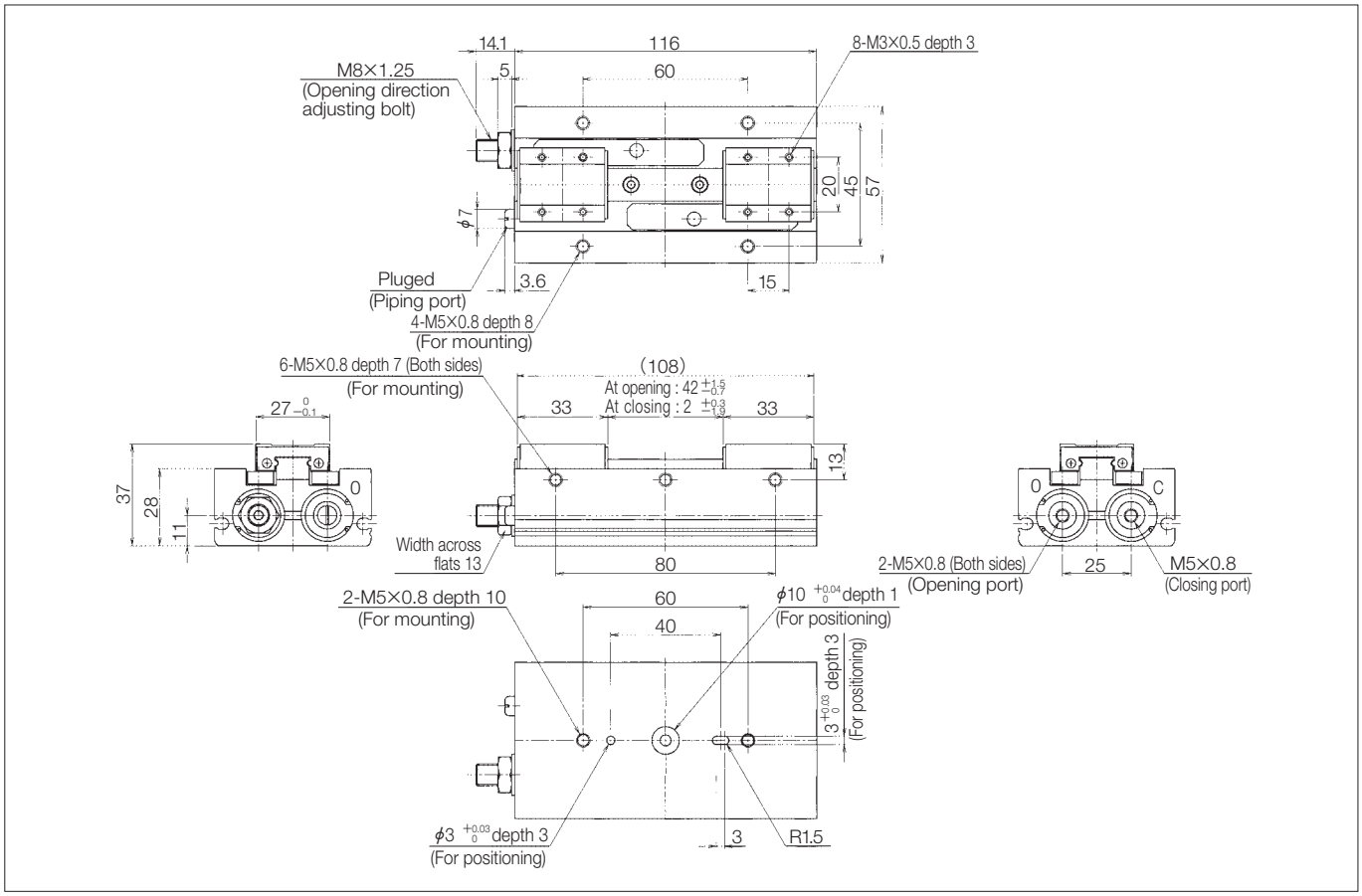
(Unit : mm)



DIMENSIONS

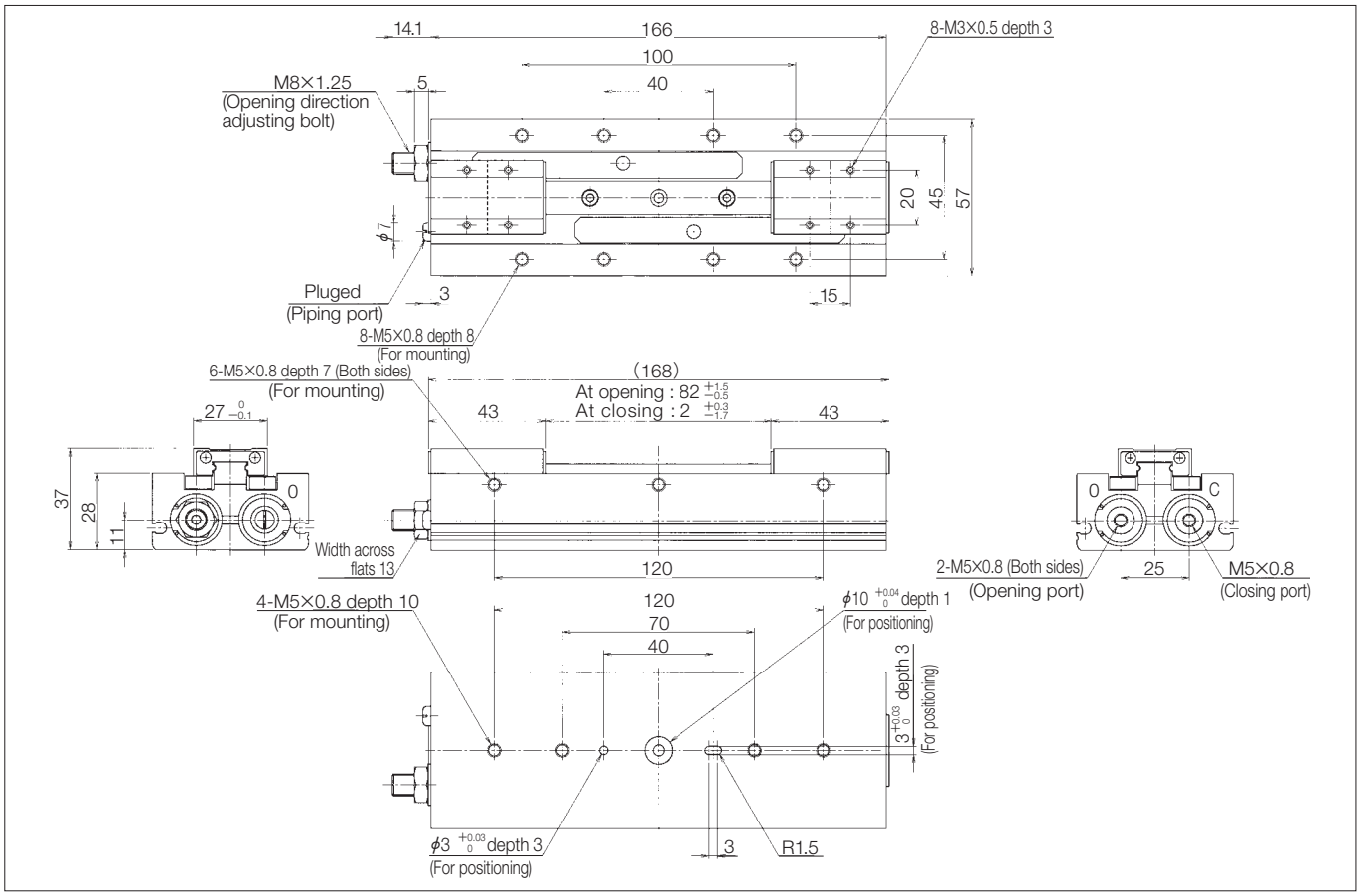
GPDL-18JA-S

(Unit : mm)



GPDL-18JA-L

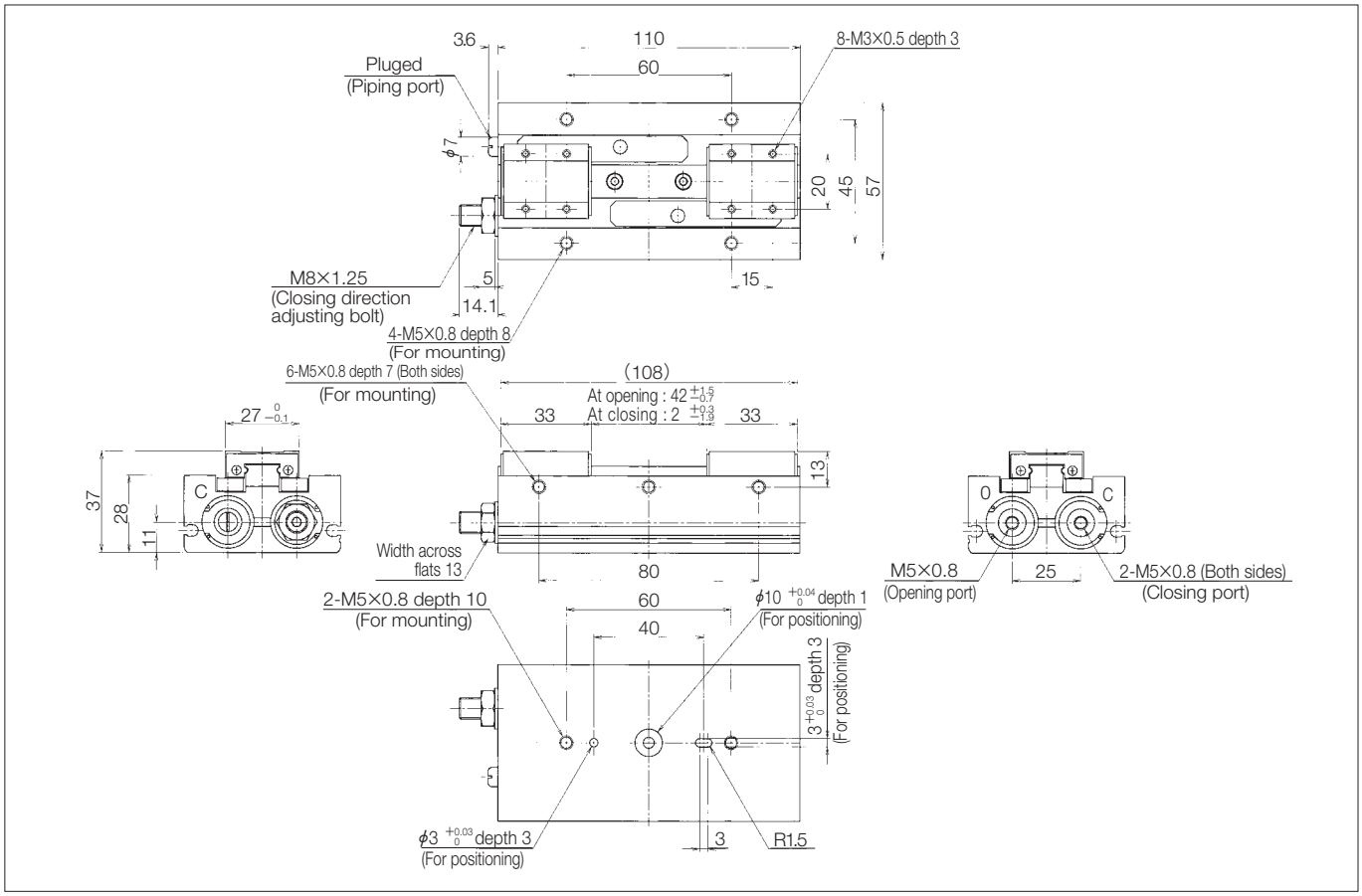
(Unit : mm)



DIMENSIONS

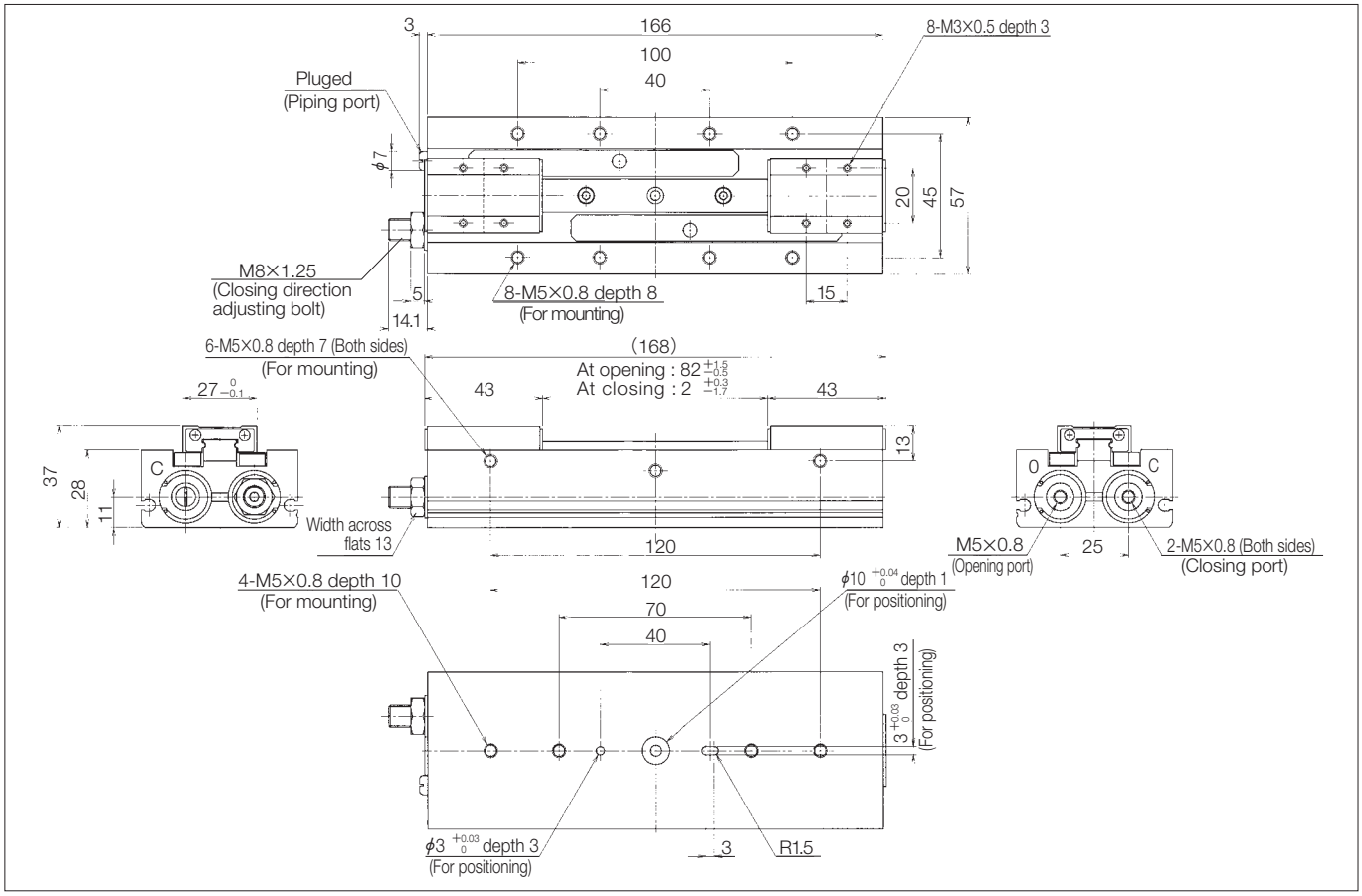
GPDL-18JB-S

(Unit : mm)



GPDL-18JB-L

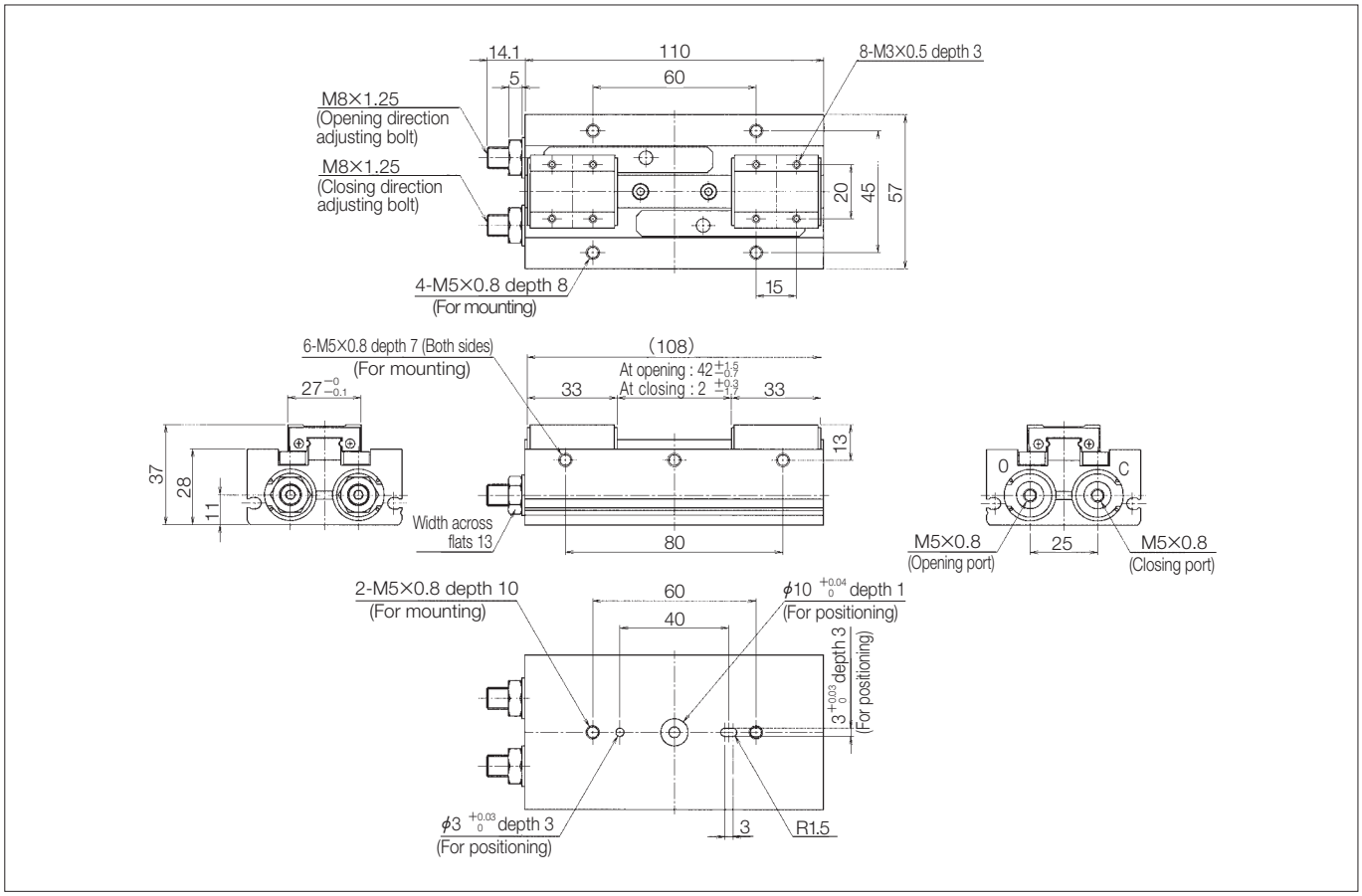
(Unit : mm)



DIMENSIONS

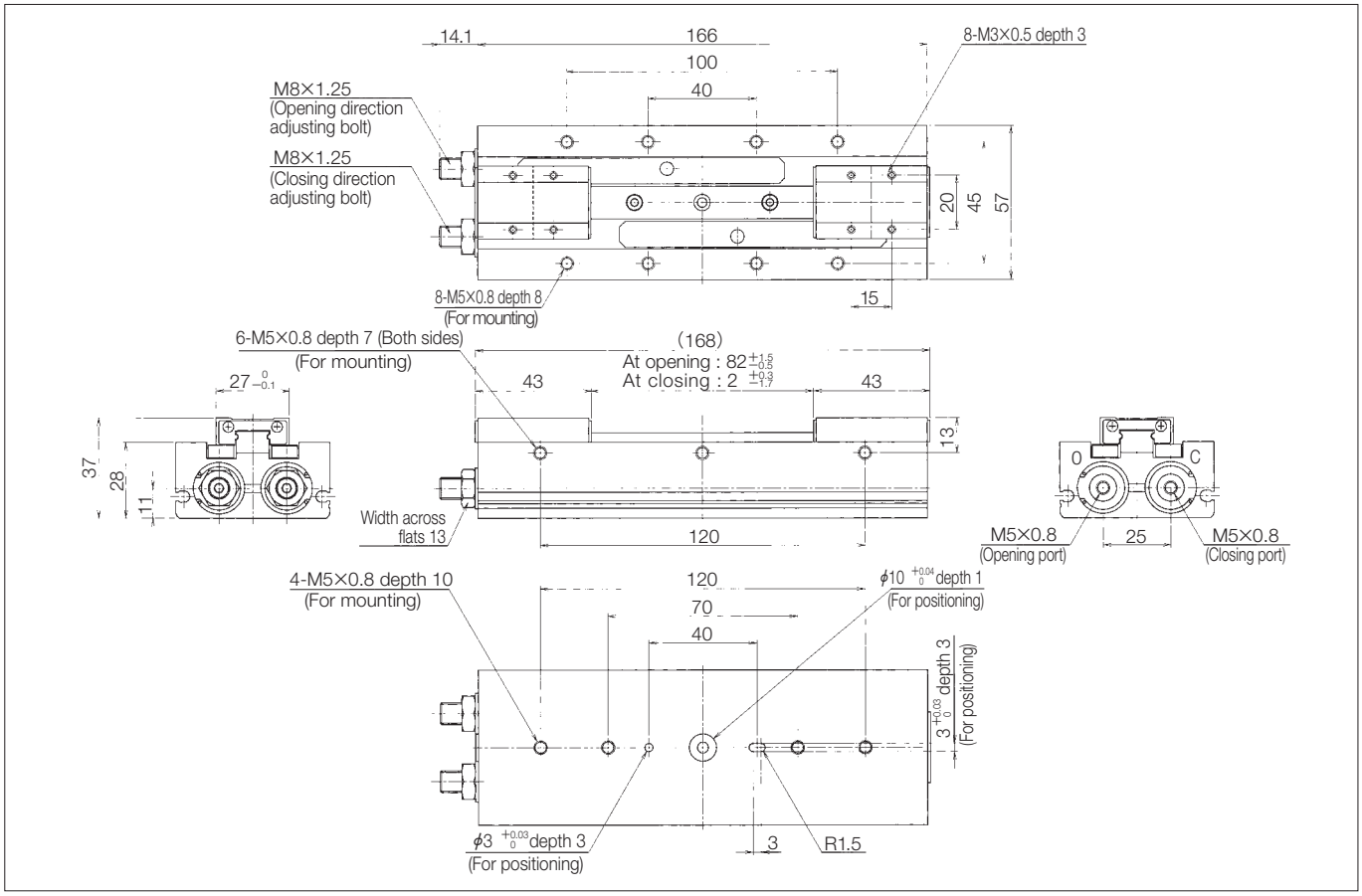
GPDL-18JC-S

(Unit : mm)



GPDL-18JC-L

(Unit : mm)

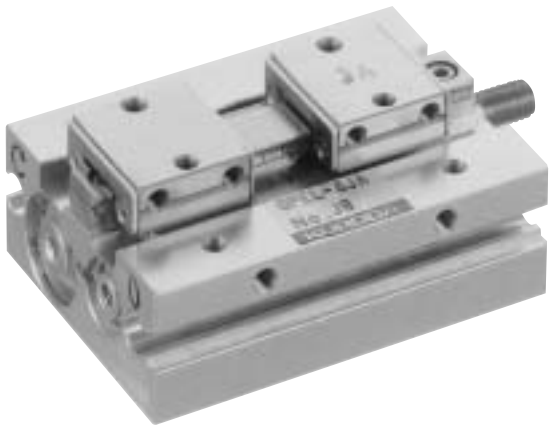


CYLINDER-DRIVEN PNEUMATIC GRIPPER

GPEL Series

ASYNCHRONOUS TYPE PARALLEL GRIPPER WITH LINEAR GUIDE

- **Asynchronous type**
  Asynchronous type designed to grip work based on the stop position of the single side finger.
- **Finely adjustable stop position**
  The stop position of the single side finger can be easily adjusted with a screw.
- **High degree of gripping accuracy and rigidity**
  Use of a linear guide in the finger has realized high degree of gripping accuracy and rigidity.
- **Extremely thin body**
  Making the cylinder horizontal has realized the light-weight and extremely thin body.
- **High gripping force**
  High gripping force owing to a double piston system.
- **Repeatability : ±0.01 mm**
- **Centering accuracy**
  Adjustable to zero.
- **Two switches available as attachment**
  This series can be equipped with 2 switches to check opening and closing of the finger.
  The switch is fitted into the groove provided on the side of the gripper body.
- **Gripper body can be installed to turn to any of 3 directions.**



SPECIFICATIONS

Model No.	Unit	GPEL-8JA	GPEL-8JB	GPEL-12JA	GPEL-12JB
Cylinder ID	mm	8		12	
Operating method		Double acting type			
Fluid		Non-lubricated air			
Operating pressure range	MPa	0.2～0.7		0.15～0.7	
Operating ambient temperature	℃	0～60			
Port size		M3×0.5		M5×0.8	
Maximum stroke	mm	16		22	
Direction of adjustment & width	mm	Opening : 8 max.	Closing : 8 max.	Opening : 8 max.	Closing : 8 max.
Gripping force	N	16.8	16.8	44.2	44.2
Mass	g	85		195	

(Note) • Gripping force is the value at 0.5 MPa and L (length to grip point)=30 mm.
• When using it at temperature of 5℃ or below, use dry air that has passed through an air dryer to prevent condensation, freeze, etc.

PARALLEL GRIPPER/GPEL Series

ORDERING INSTRUCTIONS

GPEL	-	12	JA	-	ZE135	A	2
①		②	③		④	⑤	⑥

①Model No.

②Cylinder ID

8	ϕ8
12	ϕ12

③Operating method

JA	Double acting type with opening direction stroke adjustment
JB	Double acting type with closing direction stroke adjustment

④Switch

No mark	No switch	
ZE135	DC10～28V	2-wire proximity switch
ZE235	DC4.5～28V	
ZE155	DC10～28V	3-wire proximity switch
ZE255	DC4.5～28V	

⑤Switch lead length

No mark	No switch
A	1m
B	3m

⑥Number of switch

No mark	No switch
1	With 1 switch
2	With 2 switches

Parallel Gripper with Switch

ZE type proximity switch

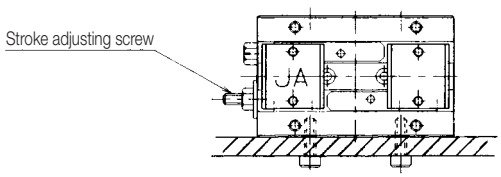
Lead wire type

Model No. of sitch		Load voltage (V)	Load current (mA)	Indicator lamp (Lights up at ON.)	Applications
2-wire type	ZE135	DC10～28	4～20	Red LED	Relay PLC IC circut
	ZE235				
3-wire type	ZE155	DC4.5～28	max. 50		
	ZE255				

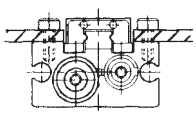
EXAMPLE OF MOUNTING

Mounting with set screw on bottm of body

Mounting with set screws on side of body

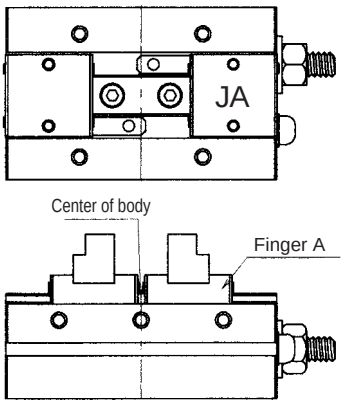


Mounting with set screw on side of finger of body

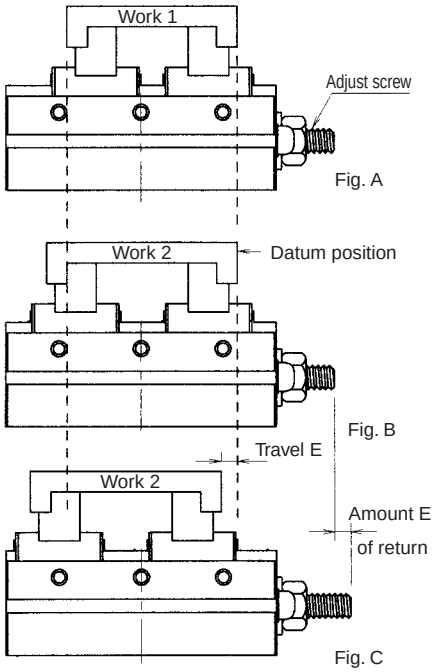


OPERATING PRINCIPLE

Opening sroke adjusting type/GPEL-□JA



Finger is closed.
With the finger closed, the amount of closing of the right finger is equal to the amount of closing of the left finger.



When the size of work to be gripped is different, finger A stops at the home position as shown in the left Fig., independently of the size of work.

Tightening the adjust screw furthermore will move the stop position of finger A to the left, and returning the adjust screw will move the stop position to the right.

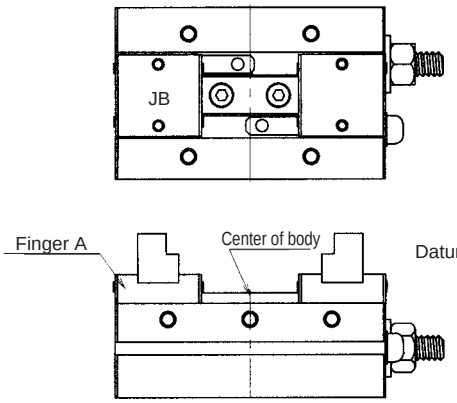
Work size in Fig. A differs from work size in Fig.B. In this case, the datum position in Fig. A is the same as that in Fig.B.

When the size of work to be gripped is equal, the datum position of work to be gripped can be moved to the right and left by means of the adjust screw. It can be used as a fine adjustment for positioning.

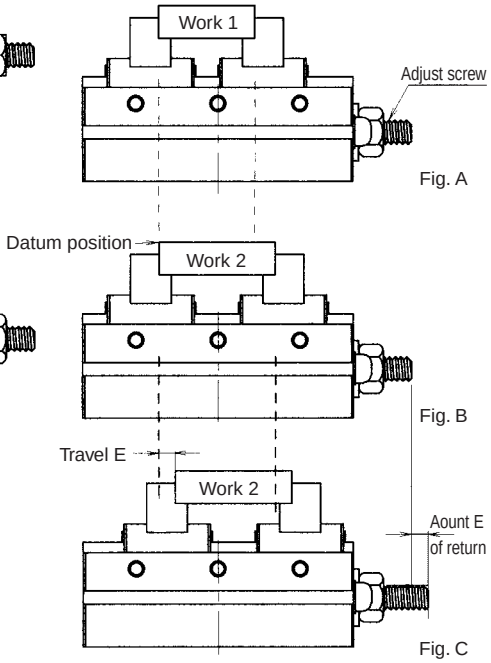
Work size in Fig. B is the same as work size in Fig. C, but Fig. C shows the status in which the adjust screw has been returned.

Work travel E equals to the amount E of returning the adjust screw.

Closing stroke adjusing type/GPEL-□JB



Finger is opened.
With the finger opened, the amount of opening of the right finger is equal to the amount of opening of the left finger.



When the size of work to be gripped is different, finger A stops at the home position as shown in the lef Fig., independetly of the size of work.

Tightening the adjust screw furthermore will move the stop position of finger A to the left, and returning the adjust screw will move the stop position to the right.

Work size in Fig. A differs from work size in Fig. B. In this case, the datum position in Fig. A is the same as that in Fig. B.

When the size of work to be gripped is equal, the datum position of work to be gripped can be moved to the right and left by means of the adjust screw. It can be used as a fine adjustment for positioning.

Work size in Fig. B is the same as work size in Fig.C, but Fig. C shows the status in which the adjust screw has been returned.

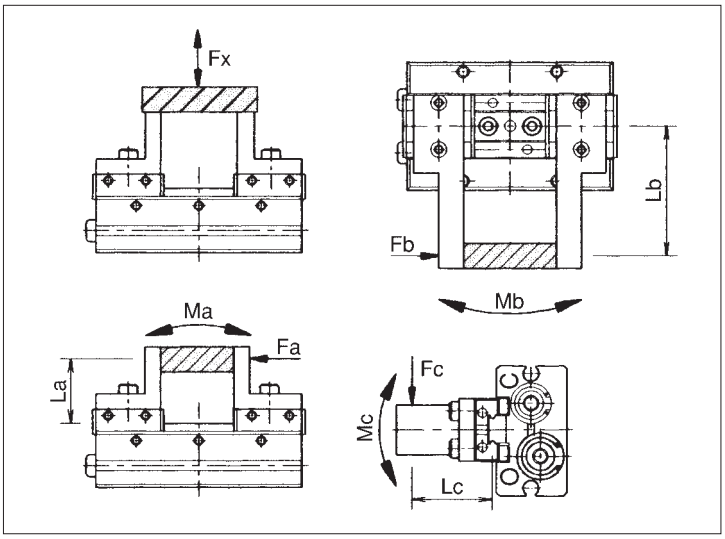
Work travel E equals to the amount E of returning the adjust screw.

PARALLEL GRIPPER/GPEL Series

ALLOWABLE LOAD AND ALLOWABLE MOMENT

Model No.	Fx (N)	Ma (N•m)	Mb (N•m)	Mc (N•m)
GPEL-8	40	0.3	0.3	0.5
GPEL-12	120	1.0	1.0	2.0

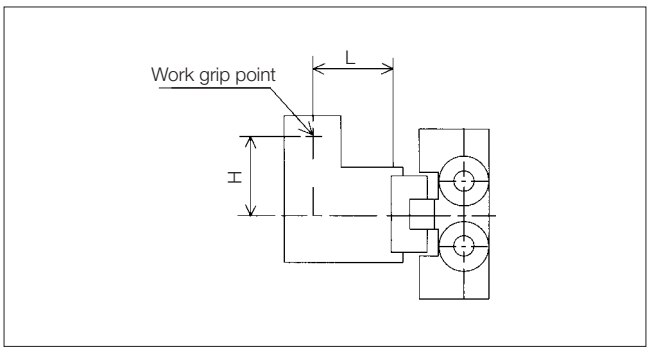
Ma=Fa×La
Mb=Fb×Lb
Mc=Fc×Lc

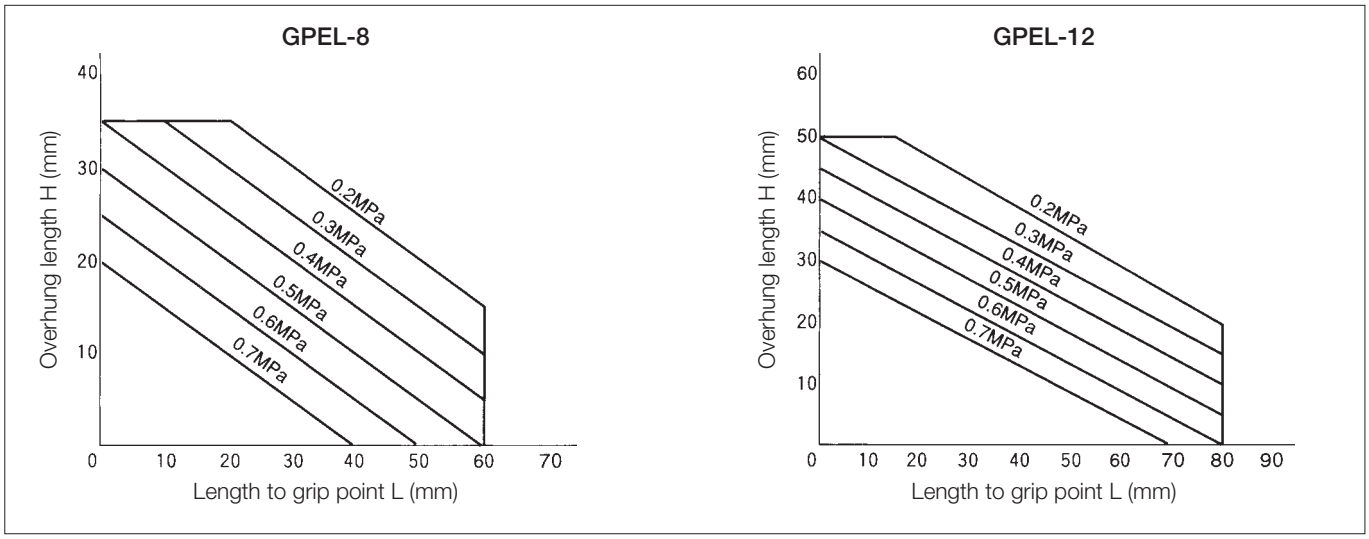


LIMITING RANGE AT GRIP POINT

⚠ CAUTION

- Set length to grip point L and overhung length H for the attachment fitted to the finger to come within the limiting range shown in Fig. below : If they are set outside the limiting range, excessively large moment is applied to the finger and guide, thus adversely affecting the life and accuracy of the gripper.
- Even if the attachment is set within the range shown in Fig. below, make it small and light as much as possible.





HOW TO SEARCH FOR GRIPPING FORCE

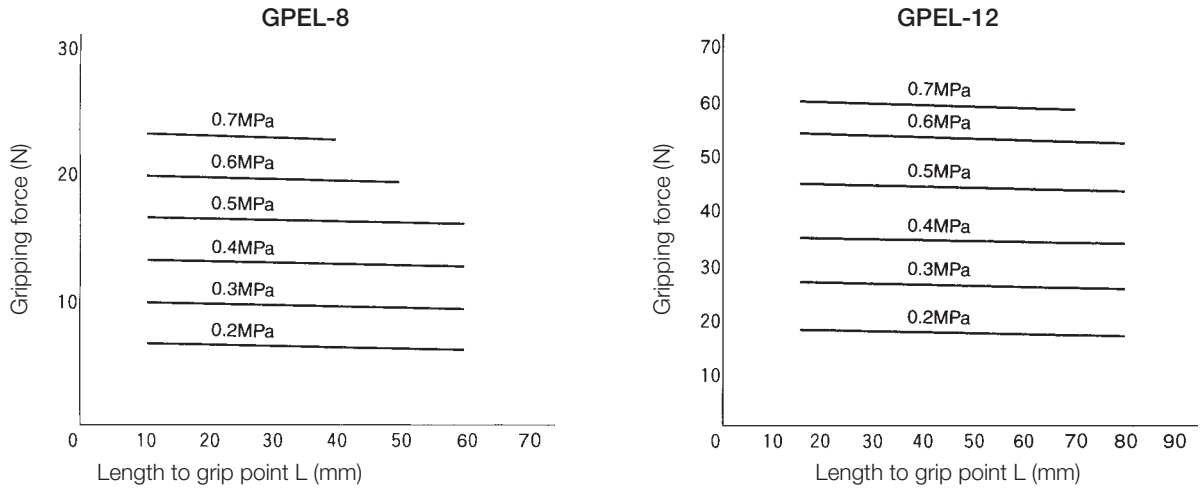
Read gripping force that satisfies the following conditions from Fig. below :

- Set the work gripping force at 10 to 20 times as much as work load.
- Set the gripping force at the time of moving the gripper with work gripped at 30 to 50 times as much as work load. It is required to prevent the jumping out and dropping of work while the gripper is moving.

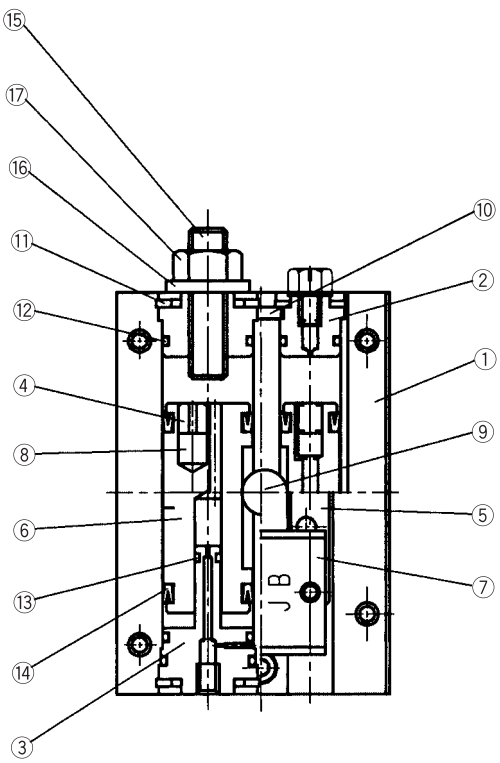
⚠ CAUTION

- Set gripping force by referring to the following guide value. In this case, take into account an allowance as much as possible.
- If great acceleration or impact is applied when carrying work, gripping force over the following guide value will be needed.

AVERAGE GRIPPING FORCE (Effective value)



CONSTRUCTIONS AND MAIN PARTS

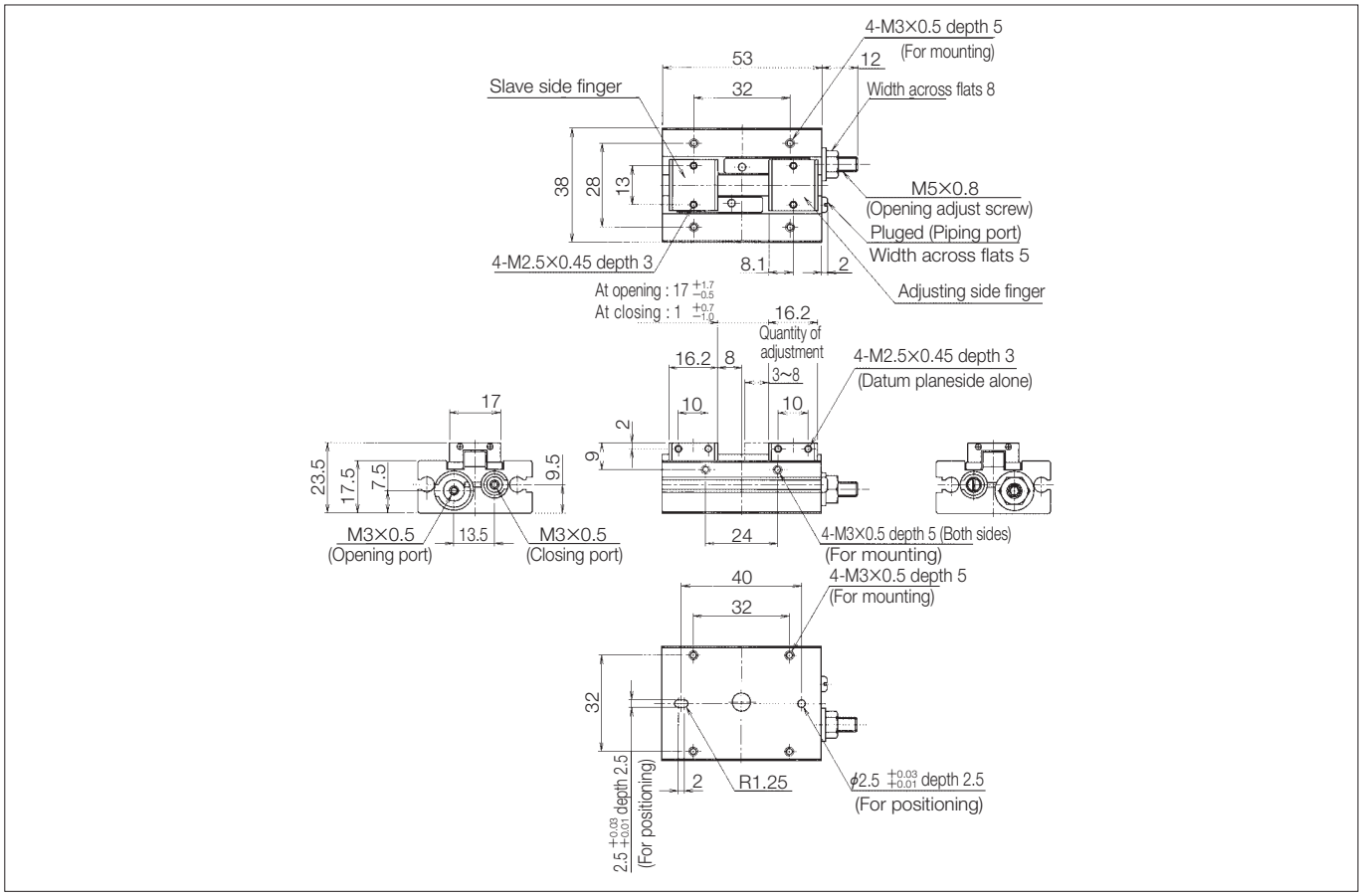


No.	Description	Material
1	Body	Aluminium alloy
2	Head cover	Aluminium alloy
3	Head cover	Aluminium alloy
4	Hold-down cover	Aluminium alloy
5	Lever	Carbon steel
6	Piston	Stainless steel
7	Bearing	Stainless steel
8	Magnet	—
9	Roller	Carbon steel
10	Roller	Carbon steel
11	Snap ring for hole	Carbon steel
12	O-ring	NBR
13	O-ring	NBR
14	Packing	NBR
15	Adjusting bolt	Carbon steel
16	Fastener seal	NBR
17	Hexagon nut	Soft steel

DIMENSIONS

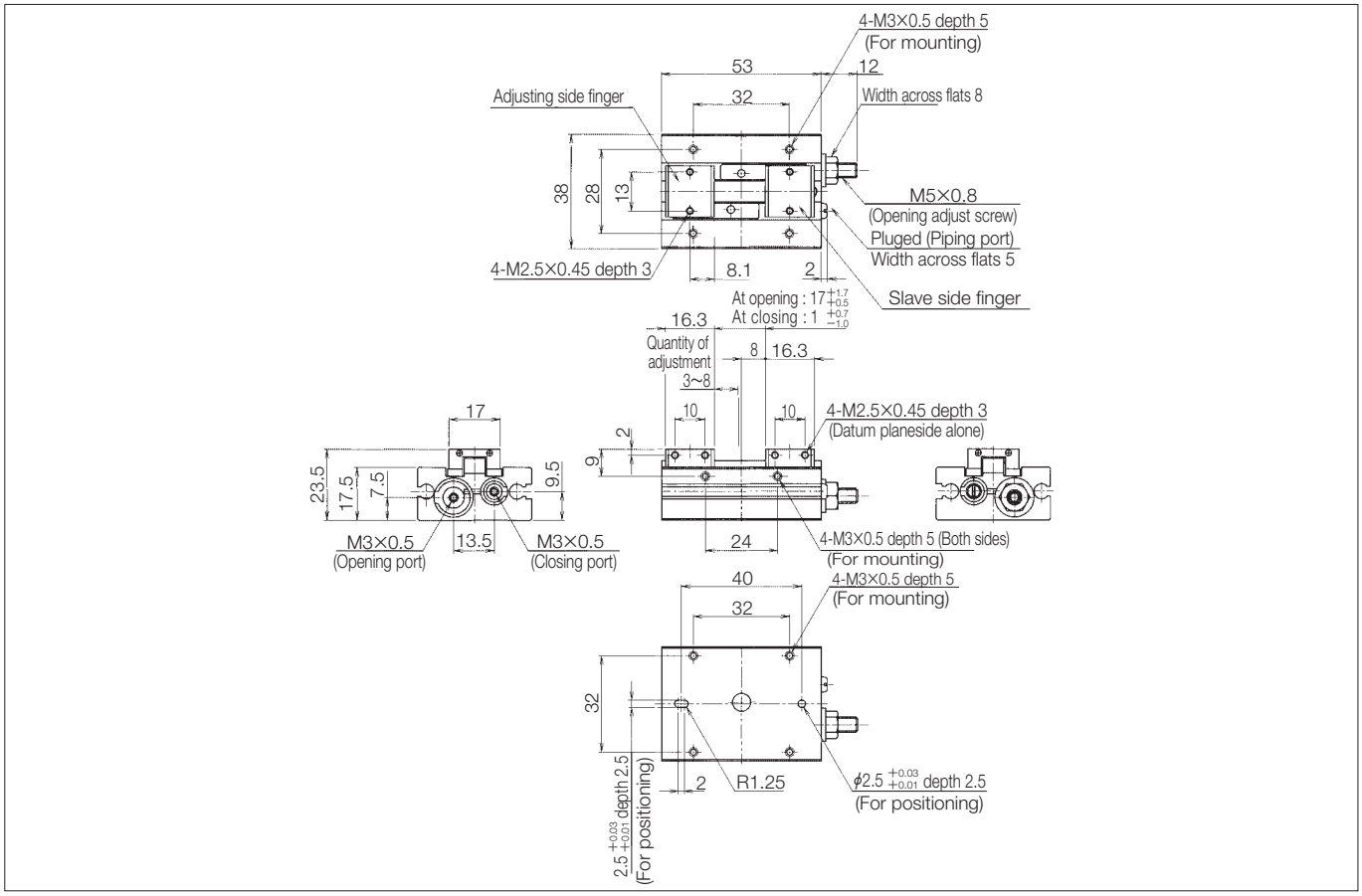
GPEL-8JA

(Unit : mm)



GPEL-8JB

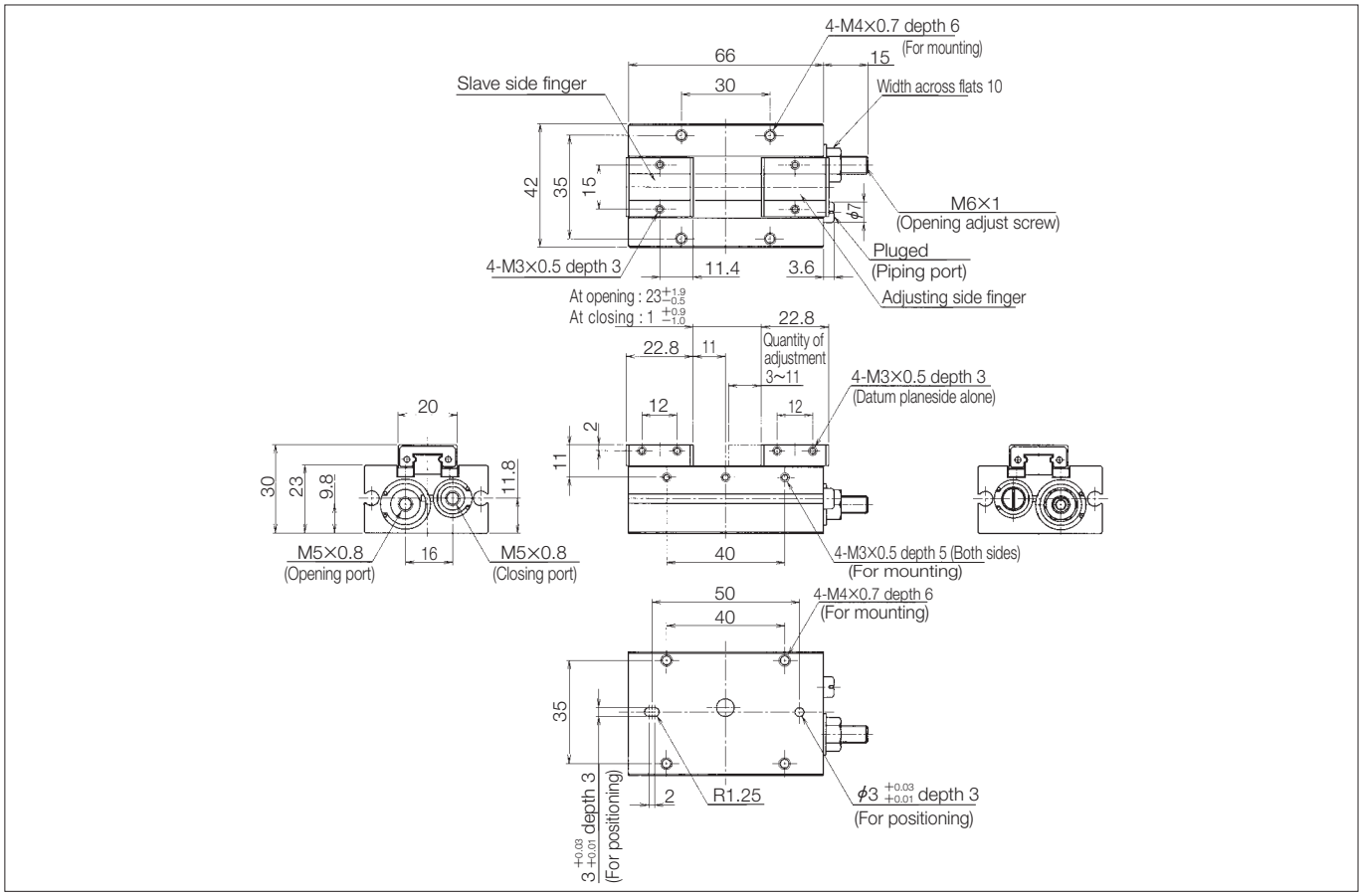
(Unit : mm)



DIMENSIONS

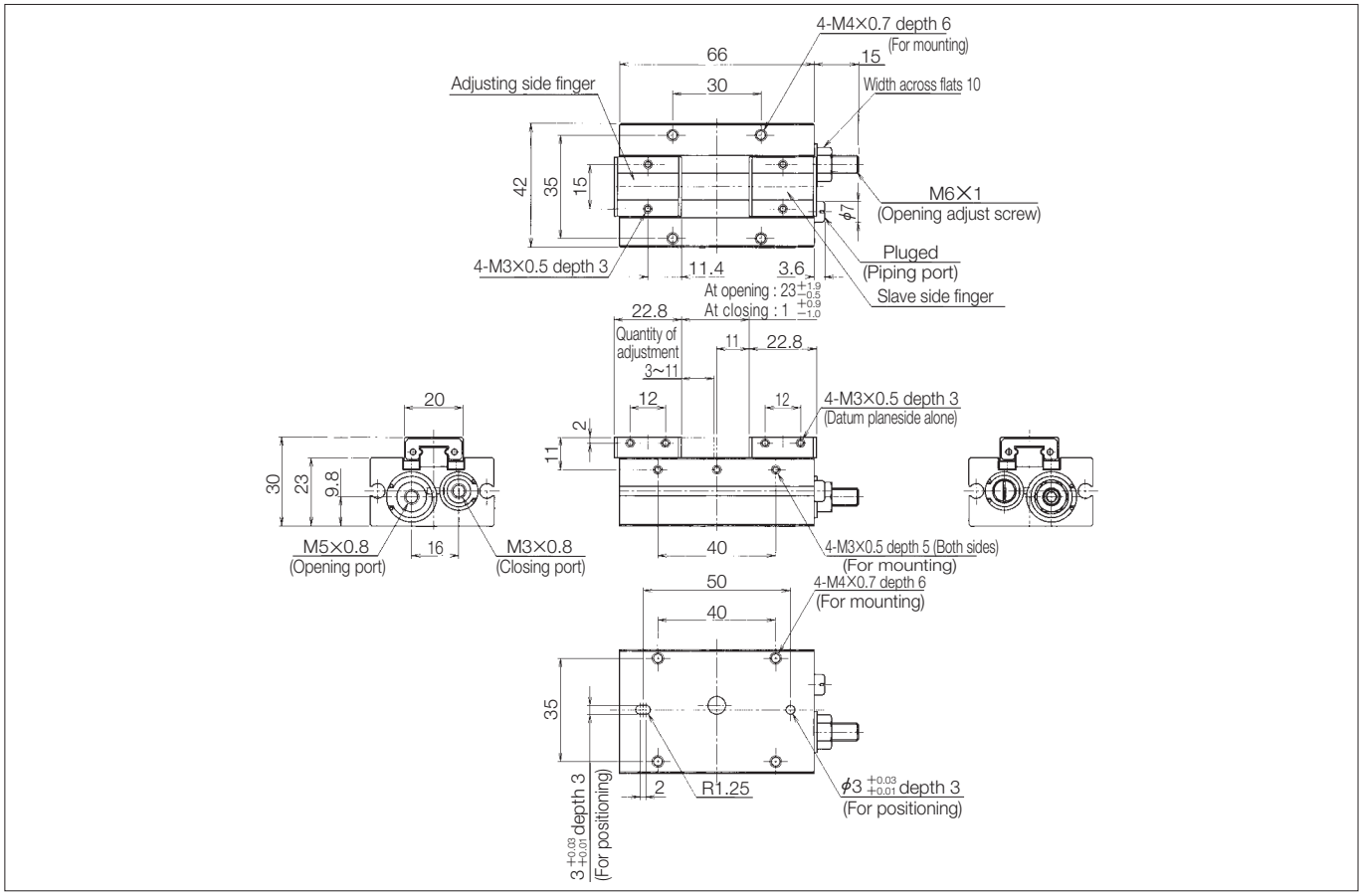
GPEL-12JA

(Unit : mm)



GPEL-12JB

(Unit : mm)

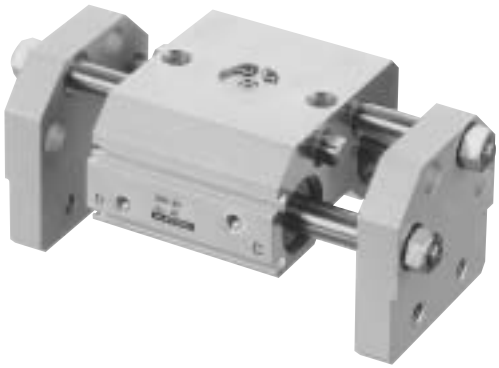


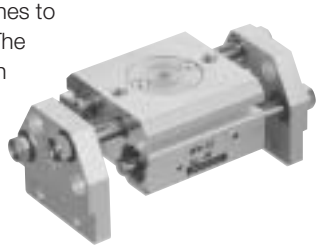
CYLINDER-DRIVEN PNEUMATIC GRIPPER

GPK Series

CRAB TYPE PARALLEL GIPPER

- **Long stroke**
  Long gripping stroke (twice as much as cylinder diameter), lightweight and compact body.
- **High gripping force and high rigidity**
  High gripping force owing to a double piston system.
- **Two switches available as attachment**
  GPK series can be equipped with 2 switches to check opening and closing of the finger. The switch is fitted into the groove provided on the side of the gripper body.
- **Gripper body can be installed to turn to any of 3 directions.**





SPECIFICATIONS

Model No.	Unit	GPK-12	GPK-16	GPK-20	GPK-25
Cylinder ID	mm	12	16	20	25
Operating method		Double acting type			
Fluid		Non-lubricated air			
Operating pressure range	MPa	0.2～0.7			
Operating ambient temperature	℃	5～60			
Port size		M5×0.8			
Maximum stroke	mm	24	32	40	50
Gripping force	N	27.8	52.2	82.1	143.3
Mass	g	85		195	

(Note) • Gripping force is the value at 0.5 MPa and L (length to grip point)=30 mm.
• When using it at temperature of 5℃ or below, use dry air that has passed through an air dryer to prevent condensation, freeze, etc.

ORDERING INSTRUCTIONS

GPK	-	12	-	ZE135	A	2
①		②		③	④	⑤

①Model No.

②Cylinder ID

12	ϕ12
16	ϕ16
20	ϕ20
25	ϕ25

③Switch

No mark	No switch	
ZE135	DC10～28V	2-wire proximity switch
ZE235	DC4.5～28V	
ZE155	DC10～28V	3-wire proximity switch
ZE255	DC4.5～28V	

④Switch lead length

No mark	No switch
A	1m
B	3m

⑤Number of switch

No mark	No switch
1	With 1 switch
2	With 2 switches

Parallel Gripper with Switch

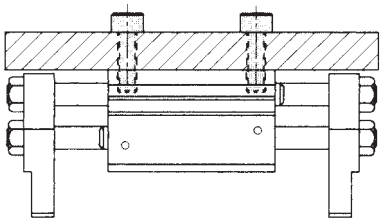
ZE type proximity switch

Lead wire type

Model No. of sitch		Load voltage (V)	Load current (mA)	Indicator lamp (Lights up at ON.)	Applications
2-wire type	ZE135	DC10～28	4～20	Red LED	Relay PLC IC circut
	ZE235				
3-wire type	ZE155	DC4.5～28	max. 50		
	ZE255				

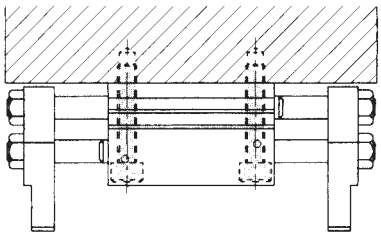
EXAMPLE OF MOUNTING

Mounting with set screw on bottm of body



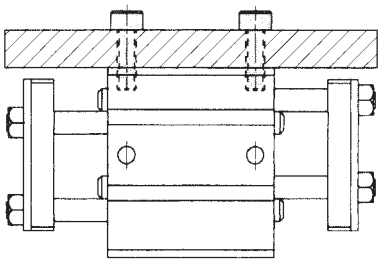
Mounting with through hole on body

(The head of the set bolt does not project.)



Mounting with set screws on side of body

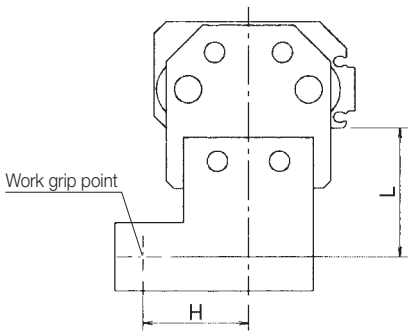
(ϕ20 and ϕ25 alone)



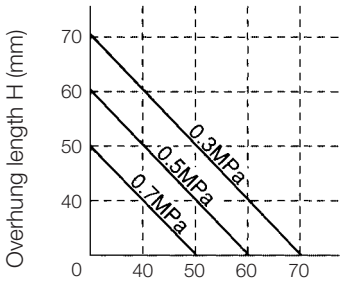
LIMITING RANGE AT GRIP POINT

⚠ CAUTION

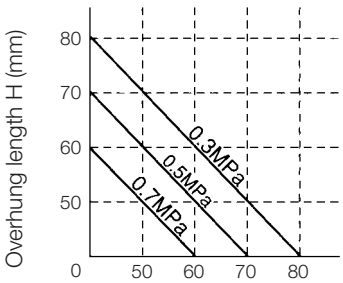
- Set length to grip point L and overhung length H for the attachment fitted to the finger to come within the limiting range shown in Fig. below :
  If they are set outside the limiting range, excessively large moment is applied to the finger and guide, thus adversely affecting the life and accuracy of the gripper.
- Even if the attachment is set within the range shown in Fig. below, make it small and light as much as possible.



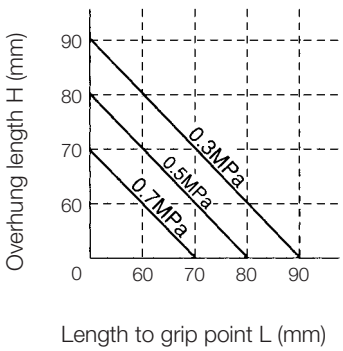
GPK-12



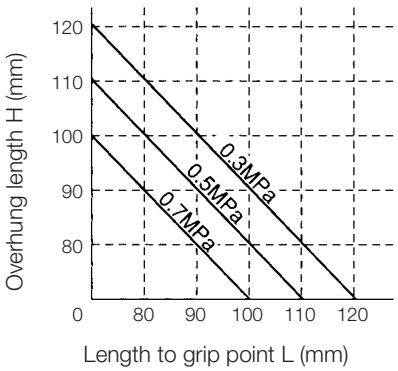
GPK-16



GPK-20



GPK-25



HOW TO SEARCH FOR GRIPPING FORCE

Read gripping force that satisfies the following conditions from Fig. below :

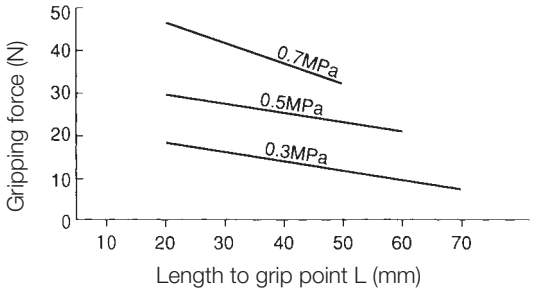
- Set the work gripping force at 10 to 20 times as much as work load.
- Set the gripping force at the time of moving the gripper with work gripped at 30 to 50 times as much as work load. It is required to prevent the jumping out and dropping of work while the gripper is moving.

⚠ CAUTION

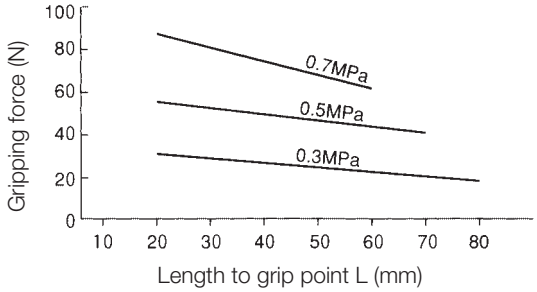
- Set gripping force by referring to the following guide value. In this case, take into account an allowance as much as possible.
- If great acceleration or impact is applied when carrying work, gripping force over the following guide value will be needed.

AVERAGE GRIPPING FORCE (Effective value)

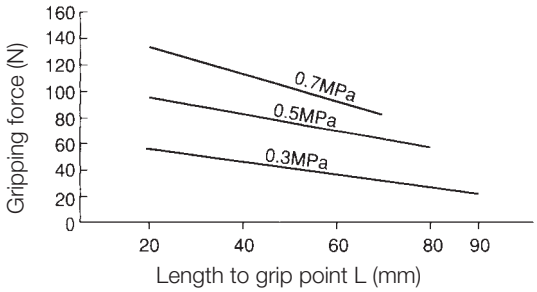
GPK-12



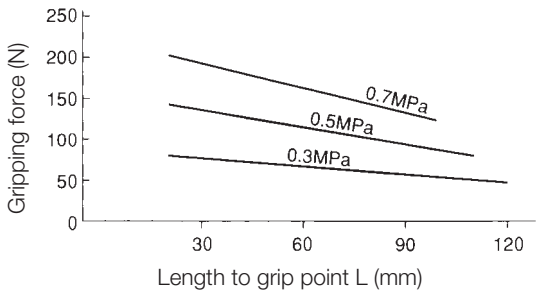
GPK-16



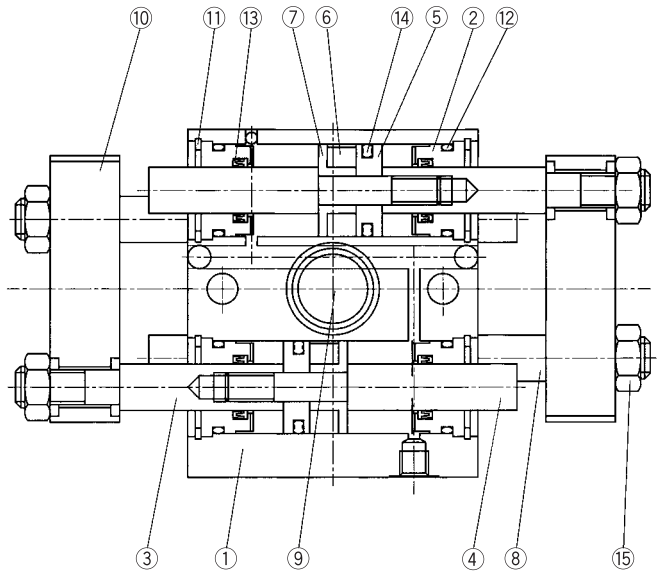
GPK-20



GPK-25



CONSTRUCTIONS AND MAIN PARTS

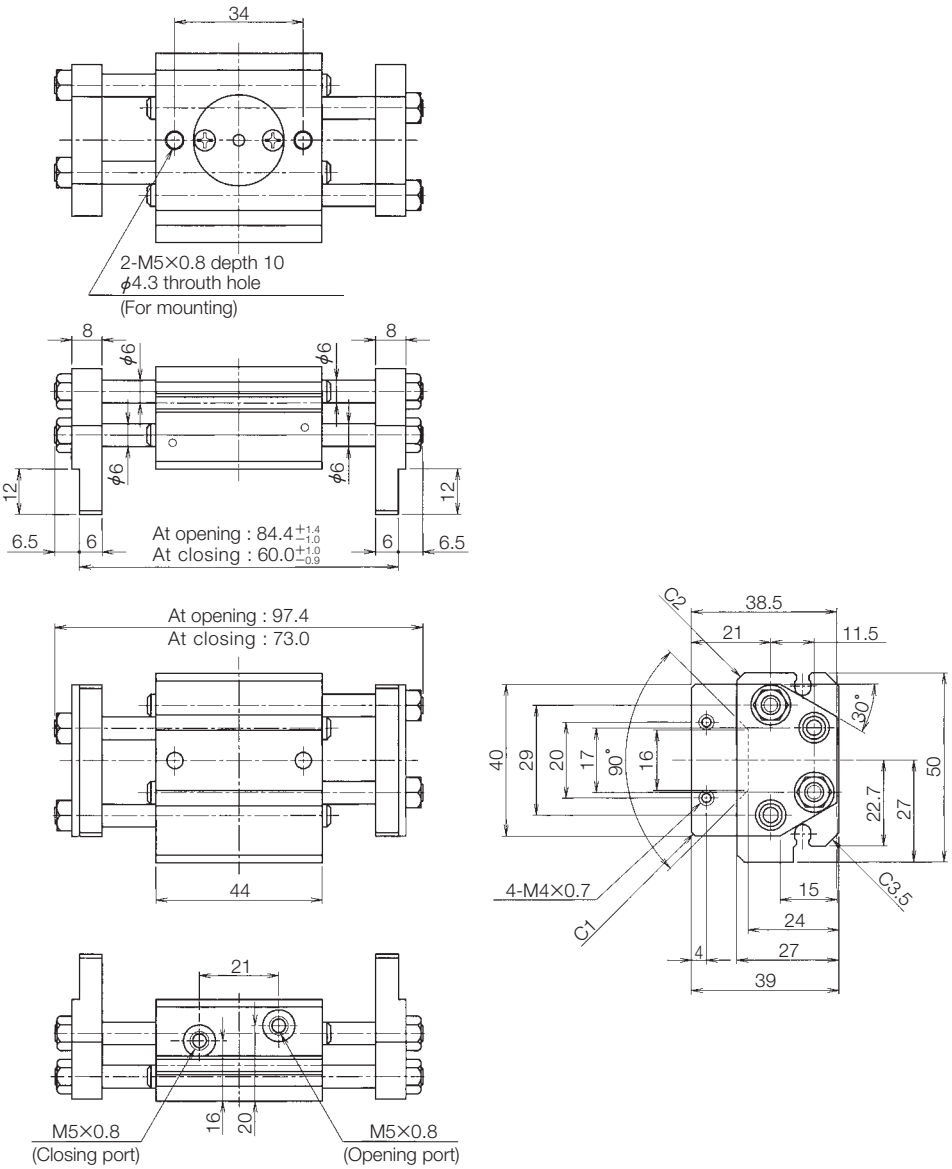


No.	Description	Material
1	Body	Aluminium alloy
2	Rod cover	Aluminium alloy
3	Piston rod A	Stainless steel
4	Piston rod B	Stainless steel
5	Piston	Aluminium alloy
6	Magnet	—
7	Magnet holder	Aluminium alloy
8	Guide rod	Stainless steel
9	Pinion	Stainless steel
10	Lever	Aluminium alloy
11	Snap ring for hole	Carbon steel
12	O-ring	NBR
13	R packing	NBR
14	P packing	NBR
15	Hexagon nut	Carbon steel

DIMENSIONS

GPK-12

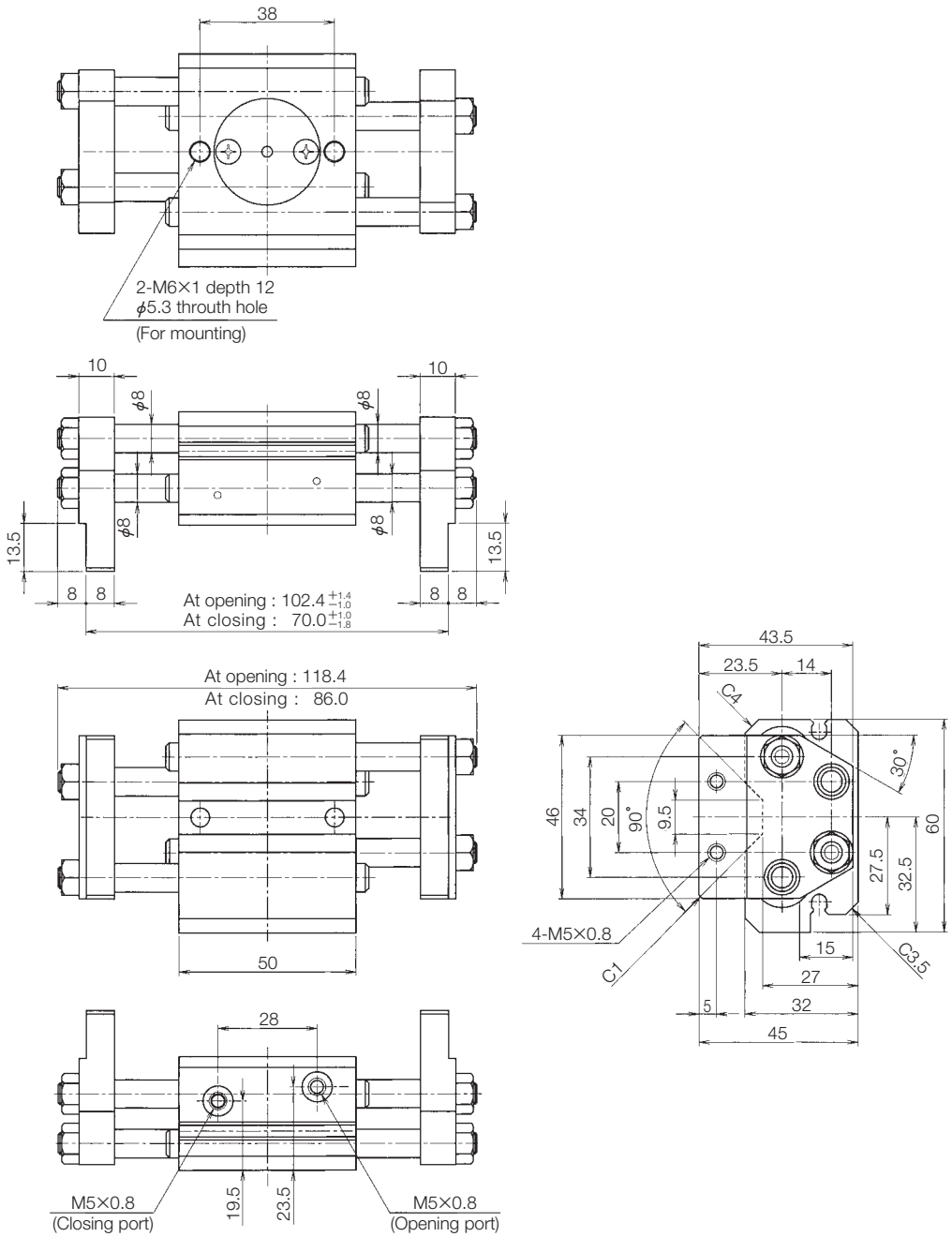
(Unit : mm)



DIMENSIONS

GPK-16

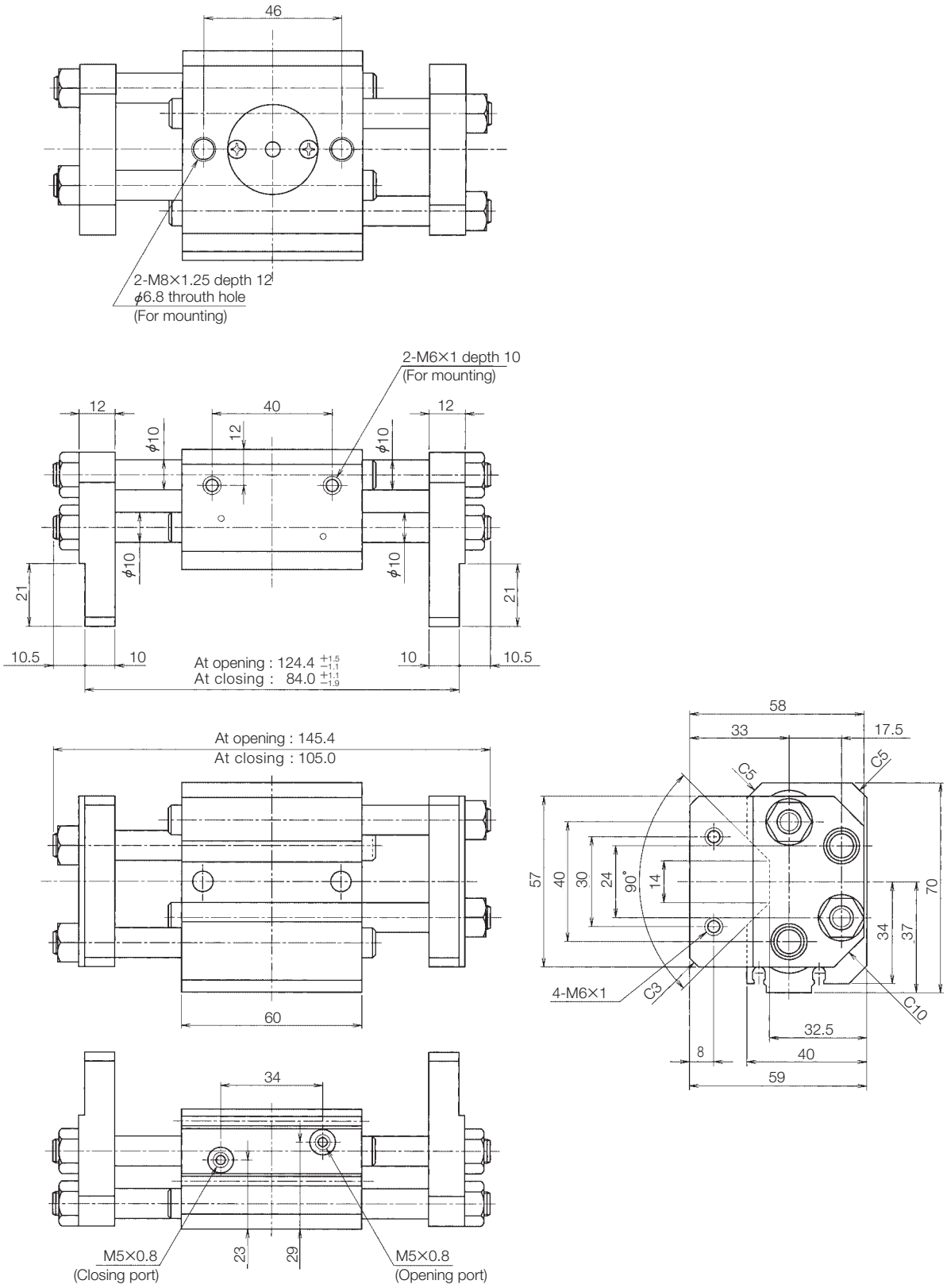
(Unit : mm)



DIMENSIONS

GPK-20

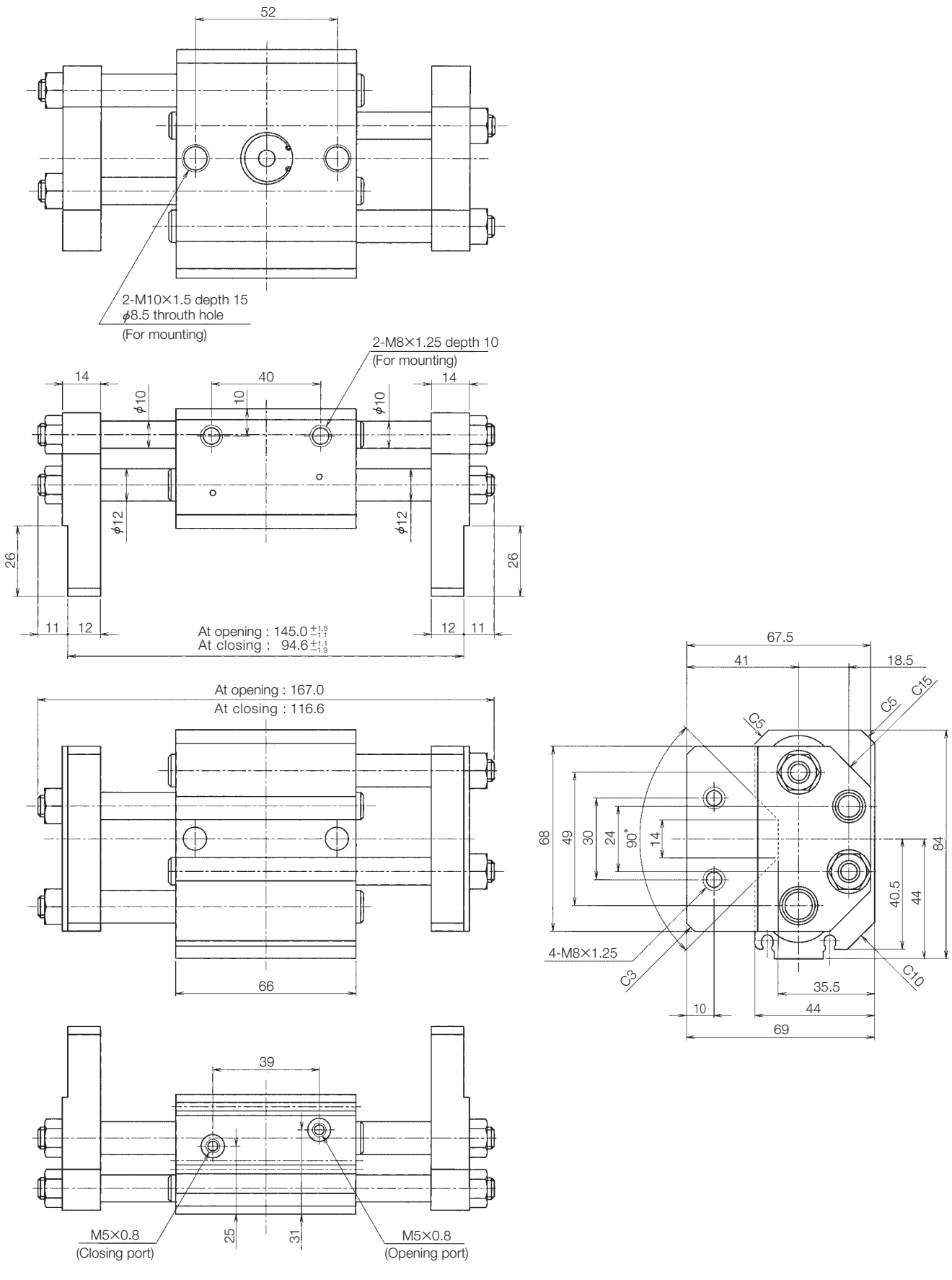
(Unit : mm)



DIMENSIONS

GPK-25

(Unit : mm)



CYLINDER-DRIVEN PNEUMATIC GRIPPER

GVC Series

ROTATING GRIPPER

● **Long life**

The finger is made of chromium molybdenum steel and the main part is hardened, assuring long service life.

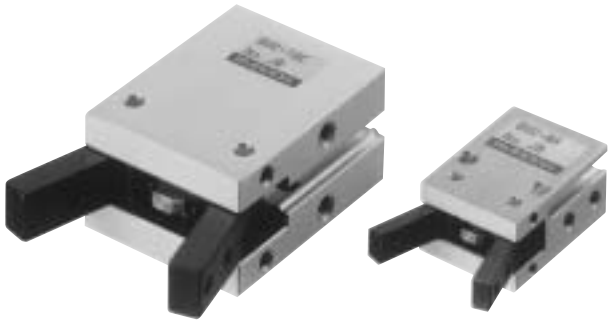
● **Switches available as attachment**

GVC series can be equipped with 2 switches to check opening and closing of the finger.
The switch is fitted into the groove provided on the side of the gripper body.

● **Optional adaptor**

Optional adaptors are available. (Except for ϕ8)

● **Gripper body can be installed to turn to any of 3 directions.**



SPECIFICATIONS

Model No.		Unit	GVC-8C	GVC-10C	GVC-16C	GVC-20C	GVC-25C
Cylinder ID		mm	8	10	16	20	25
Operating method			Double acting type				
Fluid			Non-lubricated air				
Operating pressure range		MPa	0.22～0.7	0.1～0.7			
Operating ambient temperature		℃	5～60				
Port size			M3×0.5		M5×0.8		
Finger opening angle		Degree	−10～+30				
Gripping force	Closing	N	2.0	2.5	12.8	24	48
	Opening	N	1.3	3.8	17	32	62
Mass		g	23	40	96	180	313

Model No.		Unit	GVC-8A	GVC-10A	GVC-16A	GVC-20A	GVC-25A
Cylinder ID		mm	8	10	16	20	25
Operating method			Double acting type				
Fluid			Non-lubricated air				
Operating pressure range		MPa	0.36～0.7	0.3～0.7	0.2～0.7		
Operating ambient temperature		℃	5～60				
Port size			M3×0.5		M5×0.8		
Finger opening angle		Degree	−10～+30				
Gripping force	Closing	N	1.4	1.4	10	18	38
	Opening	N	0.85	1	2.8	6	10
Mass		g	23	40	96	182	317

(Note) • Gripping force is the value at 0.5 MPa and L (length to grip point)=30 mm. However, gripping force for GVC-8C is the value at L=20 mm. Gripping force at the time of opening by single-acting type means spring force.
• When using it at temperature of 5 ℃ or below, use dry air that has passed through an air dryer to prevent condensation, freeze, etc.

ORDERING INSTRUCTIONS

GVC - 10 C - HAE - ZE135 A 2

① ② ③ ④ ⑤ ⑥ ⑦

①Model No.

②Cylinder ID

8	ϕ8
10	ϕ10
16	ϕ16
20	ϕ20
25	ϕ25

③Operating method

C	Double acting type
A	Normally open, single acting type

④Adaptor

No mark	No adaptor
HAE	With male adaptor
HFE	With female adaptor
HFEL	With female adaptor

(Note) HFEL : ϕ16 alone

⑤Switch

No mark	No switch	
ZE135	DC10～28V	2-wire proximity switch
ZE235	DC4.5～28V	
ZE155	DC10～28V	3-wire proximity switch
ZE255	DC4.5～28V	

⑥Switch lead length

No mark	No switch
A	1m
B	3m

⑦Number of switch

No mark	No switch
1	With 1 switch
2	With 2 switches

Rotating Gripper with Switch

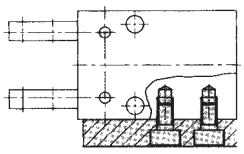
ZE type proximity switch

Lead wire type

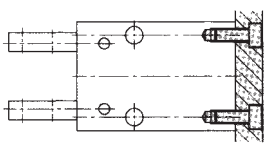
Model No. of sitch		Load voltage (V)	Load current (mA)	Indicator lamp (Lights up at ON.)	Applications
2-wire type	ZE135	DC10～28	4～20	Red LED	Relay PLC IC circuit
	ZE235				
3-wire type	ZE155	DC4.5～28	max. 50		
	ZE255				

EXAMPLE OF MOUNTING

Mounting with set screws on side of body

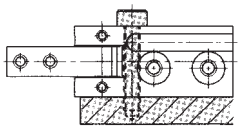


Mounting with set screws on bottom of body



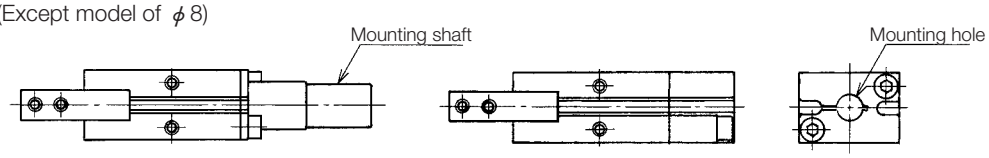
Mounting with through hole on body

(ϕ8 alone)



Mounting with adaptor

(Except model of ϕ8)



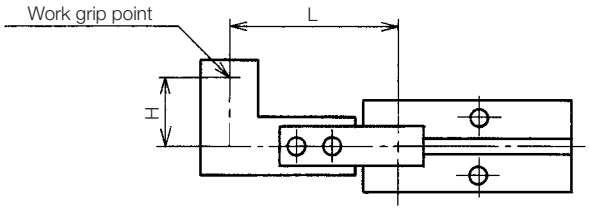
HAE type

HFE, HFEL type

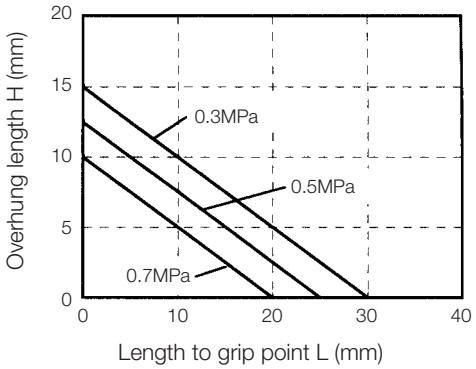
LIMITING RANGE AT GRIP POINT

⚠ CAUTION

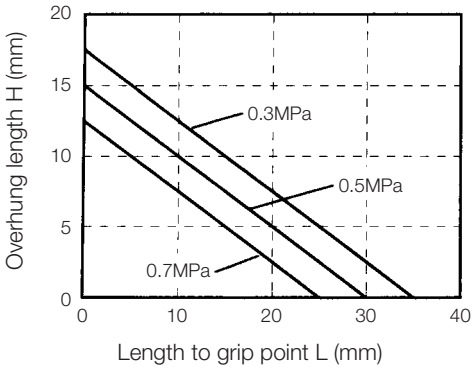
- Set length to grip point L and overhung length H for the attachment fitted to the finger to come within the limiting range shown in Fig. below : If they are set outside the limiting range, excessively large moment is applied to the finger and guide, thus adversely affecting the life and accuracy of the gripper.
- Even if the attachment is set within the range shown in Fig. below, make it small and light as much as possible.



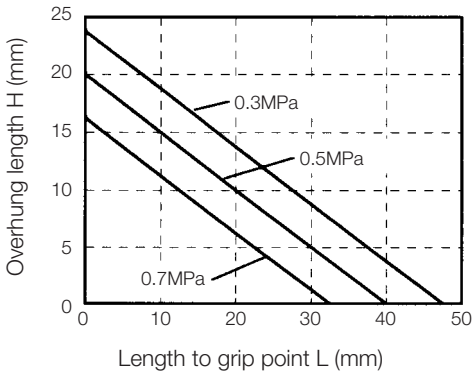
GVC-8



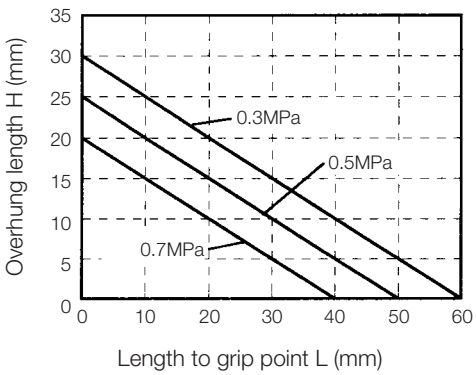
GVC-10



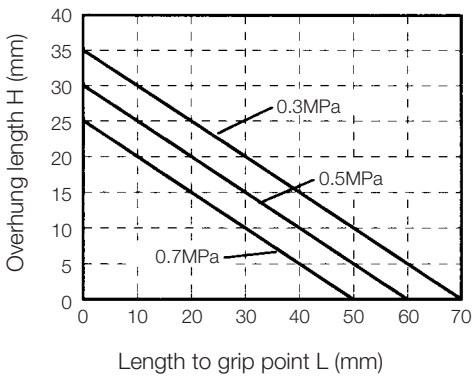
GVC-16



GVC-20



GVC-25



HOW TO SEARCH FOR GRIPPING FORCE

Read gripping force that satisfies the following conditions from Fig. below :

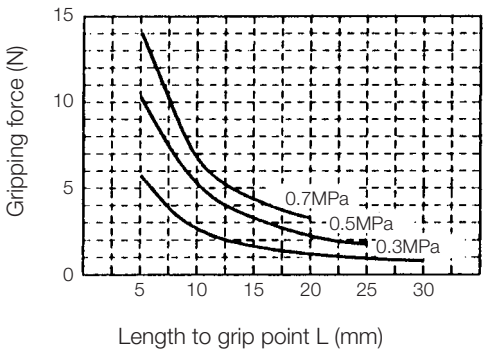
- Set the work gripping force at 10 to 20 times as much as work load.
- Set the gripping force at the time of moving the gripper with work gripped at 30 to 50 times as much as work load. It is required to prevent the jumping out and dropping of work while the gripper is moving.

⚠ CAUTION

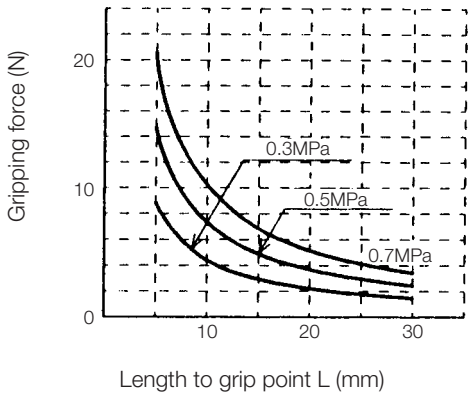
- Set gripping force by referring to the following guide value. In this case, take into account an allowance as much as possible.
- If great acceleration or impact is applied when carrying work, gripping force over the following guide value will be needed.

AVERAGE GRIPPING FORCE (Effective value)

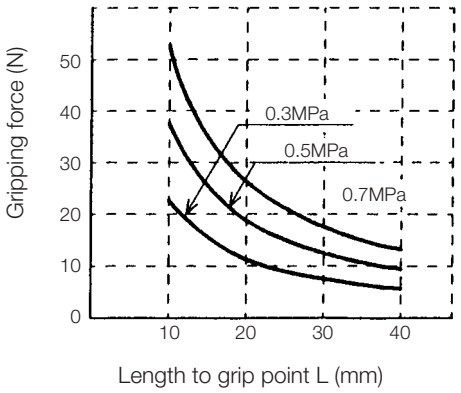
GVC-8



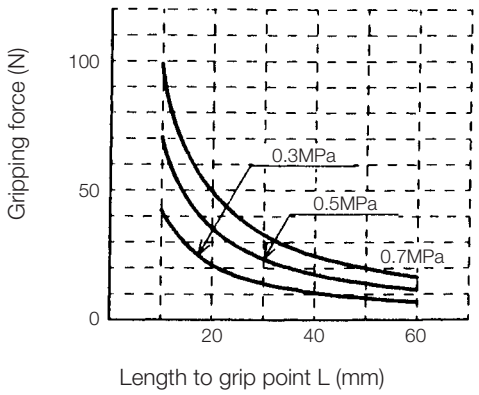
GVC-10



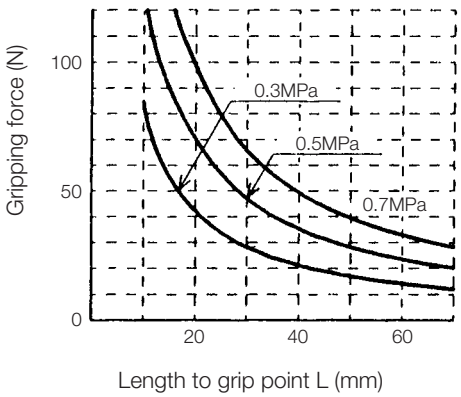
GVC-16



GVC-20

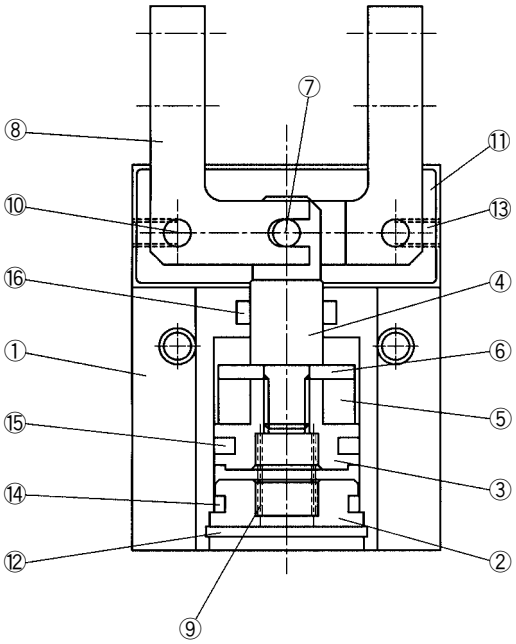


GVC-25



ROTATING GRIPPER/GVC Series

CONSTRUCTIONS AND MAIN PARTS

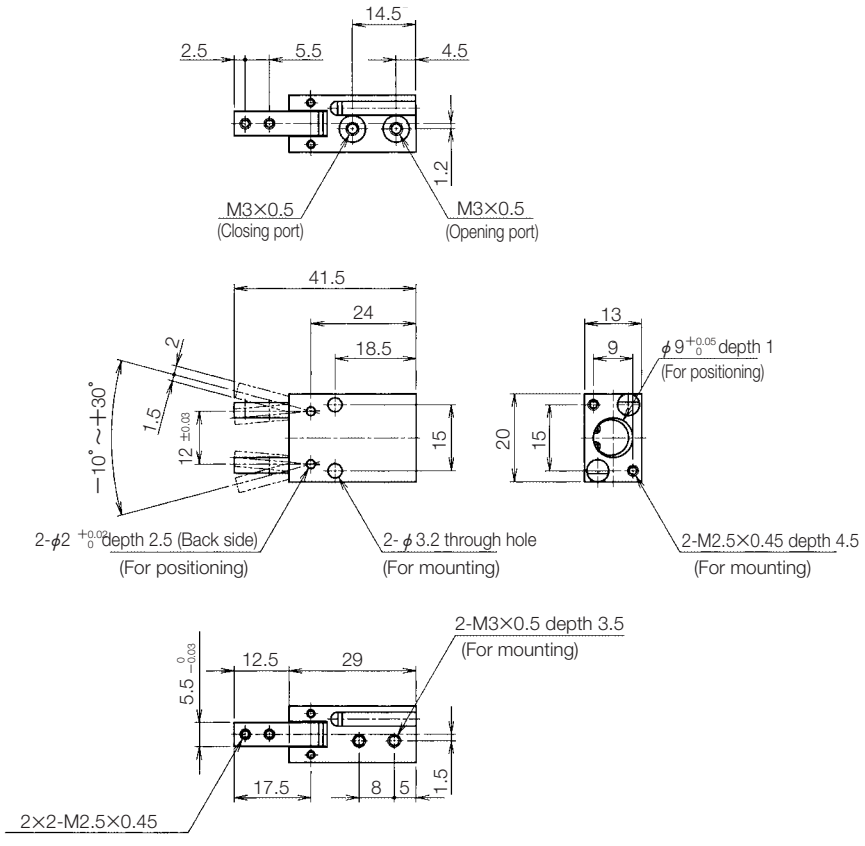


No.	Description	Material
1	Body	Aluminium alloy
2	Head cover	Aluminium alloy
3	Piston	Aluminium alloy
4	Piston rod	Stainless steel
5	Magnet	—
6	Hold-down cover	Aluminium alloy
7	Pres-fit pin	Carbon tool steel
8	Lever	Carbon tool steel
9	Spring	Piano wire
10	Fulcrum pin	Carbon tool steel
11	Slide plate	Stainless steel
12	Snap ring for hole	Hard steel
13	Hexagon socket head set screw	Chromium molybdenum steel
14	O-ring	NBR
15	Packing	NBR
16	Packing	NBR

DIMENSIONS

GVC-8C・A

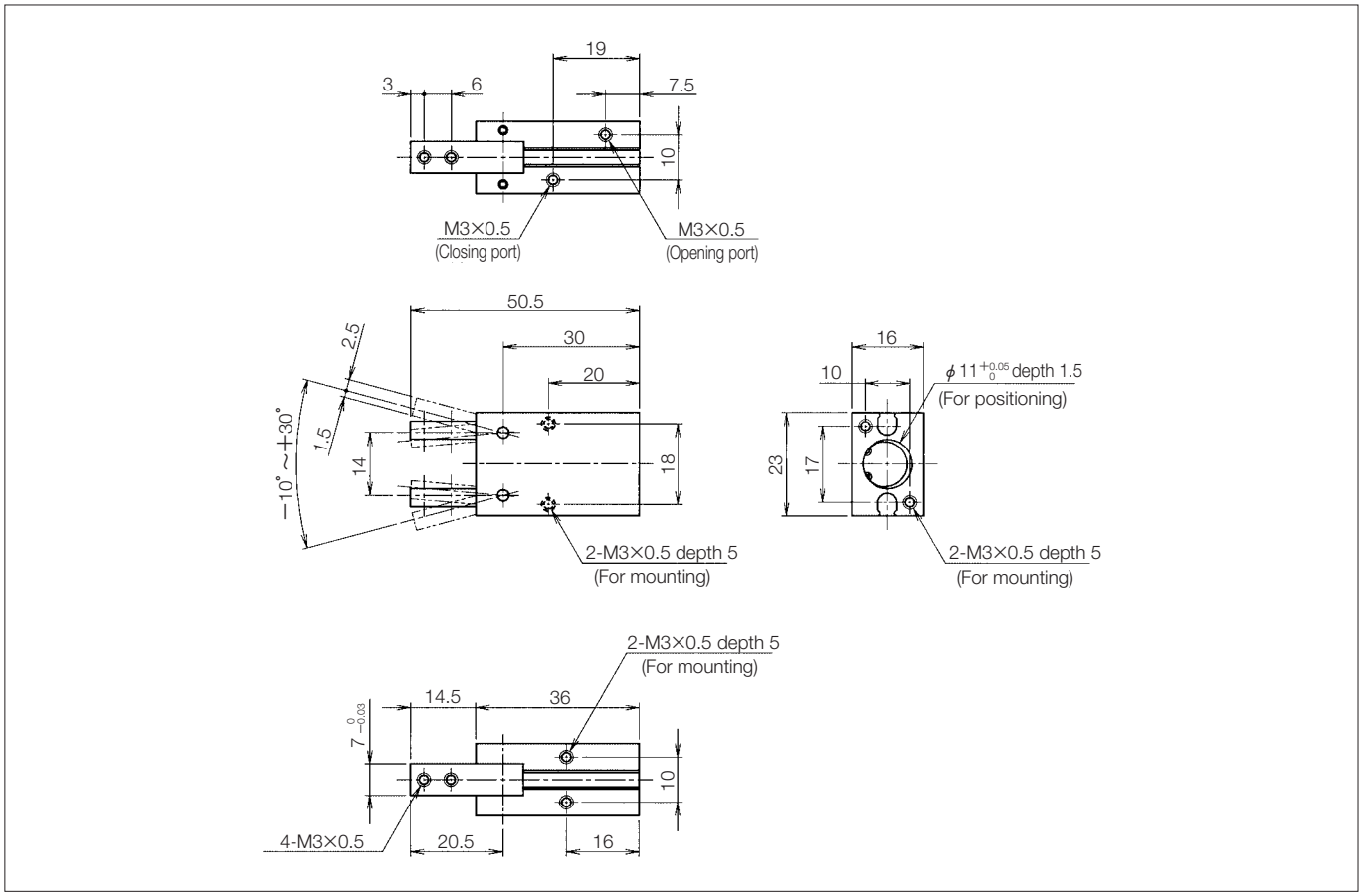
(Unit : mm)



DIMENSIONS

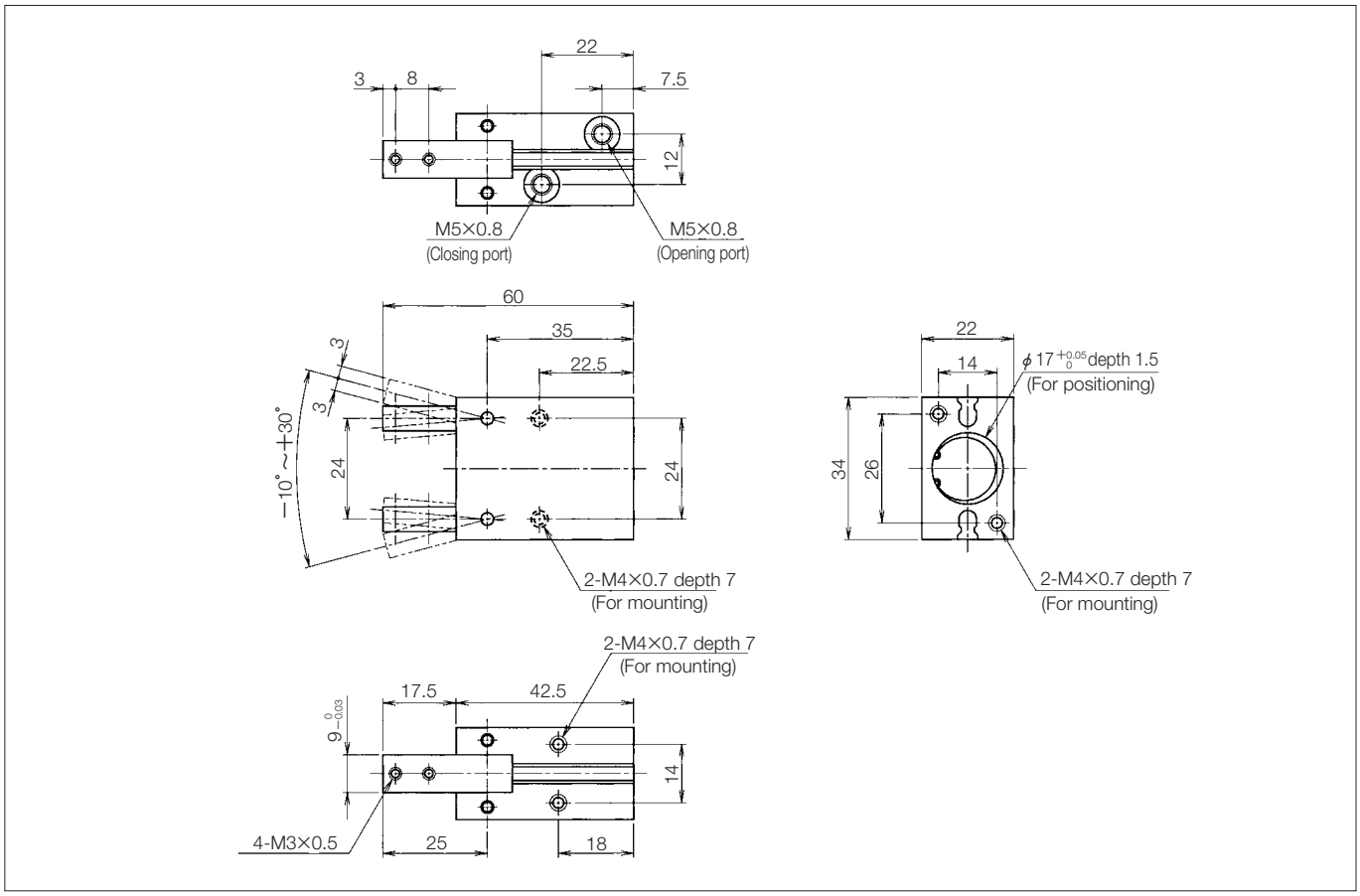
GVC-10C・A

(Unit : mm)



GVC-16C・A

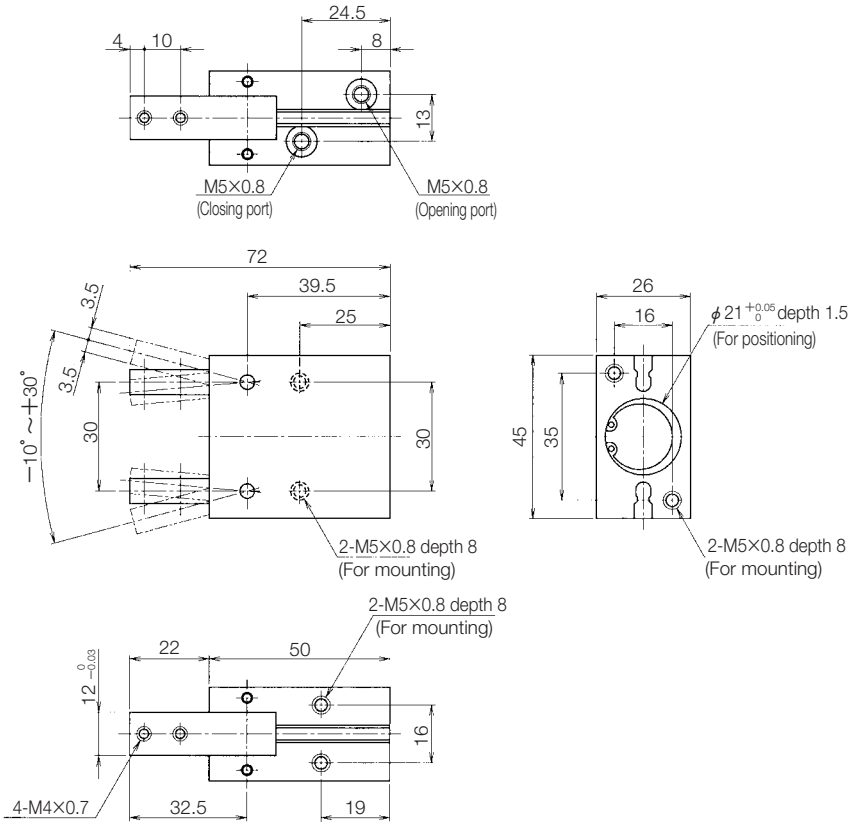
(Unit : mm)



DIMENSIONS

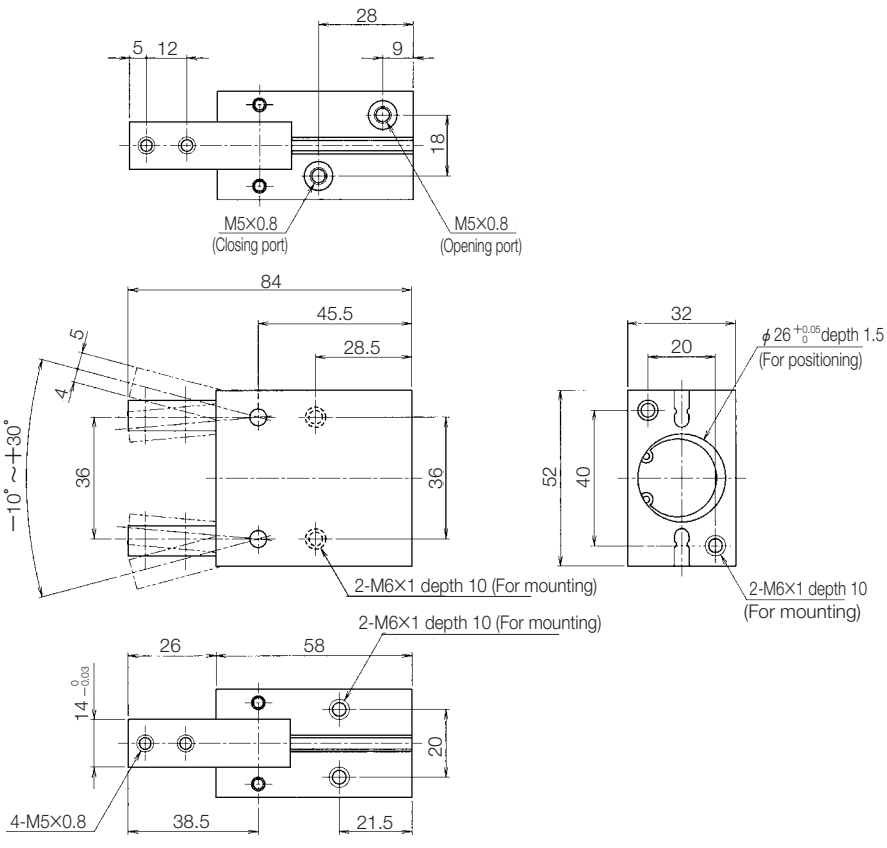
GVC-20C・A

(Unit : mm)



GVC-25C・A

(Unit : mm)



CYLINDER-DRIVEN PNEUMATIC GRIPPER

GVH Series

ROTATING GRIPPER WITH 180° FINGER OPENING

- **Finger opening angle of 180°**

  As the finger opens 180° in a straight line to eliminate interfernce between work and finger, making lateral movement possible.

- **High gripping force and high degree of gripping accuracy.**

  A link mechanism is provided to attain high gripping force (when fingers are in parallel) and high degree of gripping accuracy.

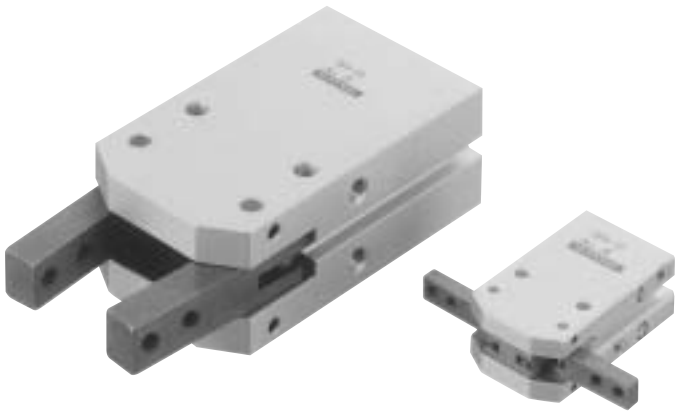
- **Switches available as attachment**

  GVH series can be equipped with 2 switches to check that finger opens and closes.
  The switch is fitted into the groove provided on the side of the gripper body.

- **Optional adaptor**

  Optional adaptors are available. (Except for ϕ8)

- **Gripper body can be installed to turn to any of 3 directions.**



SPECIFICATIONS

Model No.		Unit	GVH-12	GVH-16	GVH-20	GVH-25
Cylinder ID		mm	12	16	20	25
Operating method			Double acting type			
Fluid			Non-lubricated air			
Operating pressure range		MPa	0.2～0.7			
Operating ambient temperature		℃	0～60			
Port size			M3×0.5	M5×0.8		
Finger opening angle		Degree	−6～+180			
Gripping force	Closing	N	0.7	1.8	3.2	7.3
	Opening	N	0.8	2.1	3.8	8.7
Mass		g	55	146	277	427

(Note) • Gripping force is the value at 0.5 MPa and L (length to grip point)=30 mm.
• When using it at temperature of 5 ℃ or below, use dry air that has passed through an air dryer to prevent condensation, freeze, etc.

ROTATING GRIPPER/GVH Series

ORDERING INSTRUCTIONS

GVH	-	16	-	HAE	-	ZE135	A	2
①		②		③		④	⑤	⑥

①Model No.

②Cylinder ID

12	ϕ12
16	ϕ16
20	ϕ20
25	ϕ25

③Adaptor

No mark	No adaptor
HAE	With male adaptor
HFE	With female adaptor
HFEL	With female adaptor

(Note) HFEL : ϕ16 alone

④Switch

No mark	No switch	
ZE135	DC10～28V	2-wire proximity switch
ZE235	DC4.5～28V	
ZE155	DC10～28V	3-wire proximity switch
ZE255	DC4.5～28V	

⑤Switch lead length

No mark	No switch
A	1m
B	3m

⑥Number of switch

No mark	No switch
1	With 1 switch
2	With 2 switches

Rotating Gripper with Switch

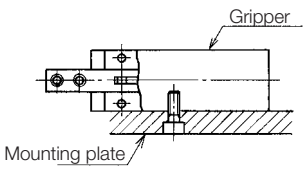
ZE type proximity switch

Lead wire type

Model No. of sitch		Load voltage (V)	Load current (mA)	Indicator lamp (Lights up at ON.)	Applications
2-wire type	ZE135	DC10～28	4～20	Red LED	Relay PLC IC circut
	ZE235				
3-wire type	ZE155	DC4.5～28	max. 50		
	ZE255				

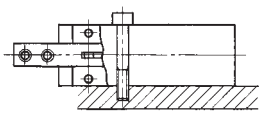
EXAMPLE OF MOUNTING

Mounting with set screws on back side of body

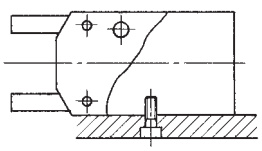


Mounting with through hole on body

(ϕ12 and ϕ25 alone)

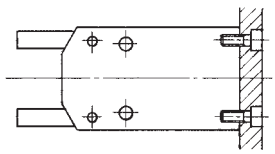


Mounting with set screws on side of body



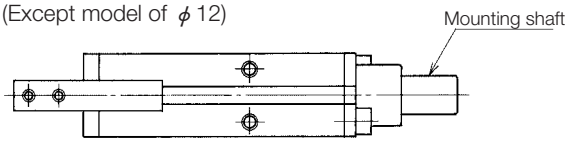
Mounting with set screw on bottom of body

(When mounting a switch, it is necessary to provide a recess, because there is the projection of the switch.)

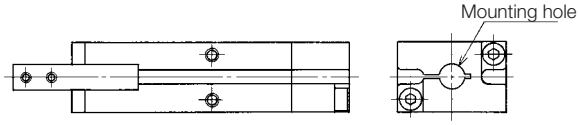


Mounting with adaptor

(Except model of ϕ12)



HAE type

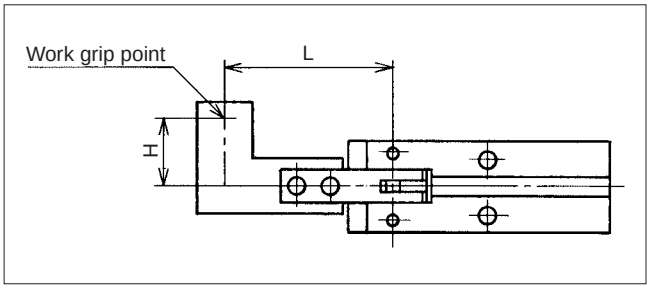


HFE, HFEL type

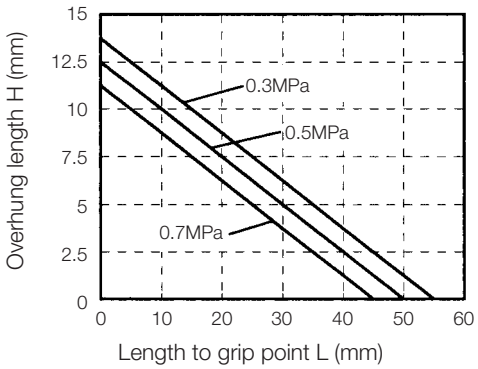
LIMITING RANGE AT GRIP POINT

⚠ CAUTION

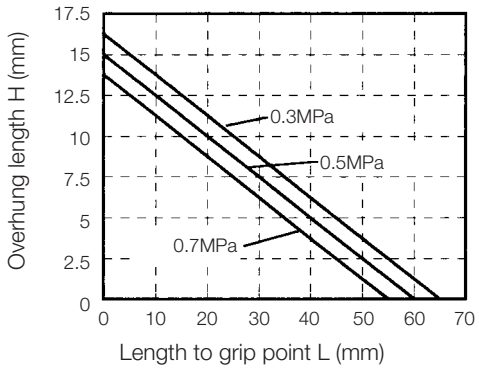
- Set length to grip point L and overhung length H for the attachment fitted to the finger to come within the limiting range shown in Fig. below :
  If they are set outside the limiting range, excessively large moment is applied to the finger and guide, thus adversely affecting the life and accuracy of the gripper.
- Even if the attachment is set within the range shown in Fig. below, make it small and light as much as possible.



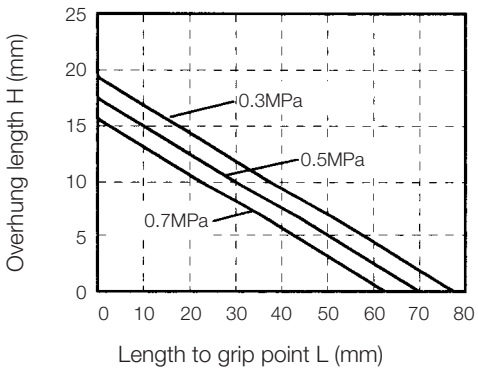
GVH-12



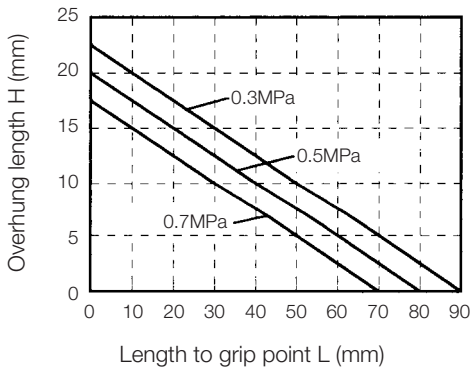
GVH-16



GVH-20



GVH-25



HOW TO SEARCH FOR GRIPPING FORCE

Read gripping force that satisfies the following conditions from Fig. below :

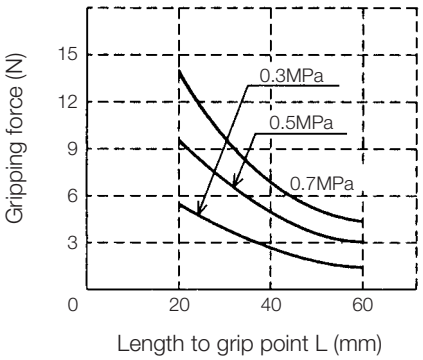
- Set the work gripping force at 10 to 20 times as much as work load.
- Set the gripping force at the time of moving the gripper with work gripped at 30 to 50 times as much as work load. It is required to prevent the jumping out and dropping of work while the gripper is moving.

⚠ CAUTION

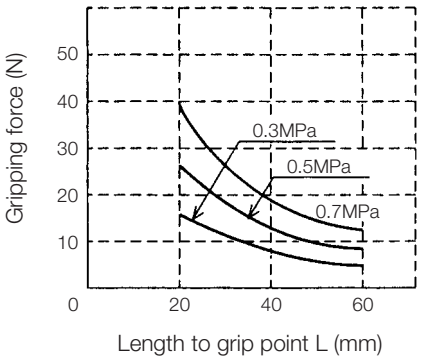
- Set gripping force by referring to the following guide value. In this case, take into account an allowance as much as possible.
- If great acceleration or impact is applied when carrying work, gripping force over the following guide value will be needed.

AVERAGE GRIPPING FORCE (Effective value)

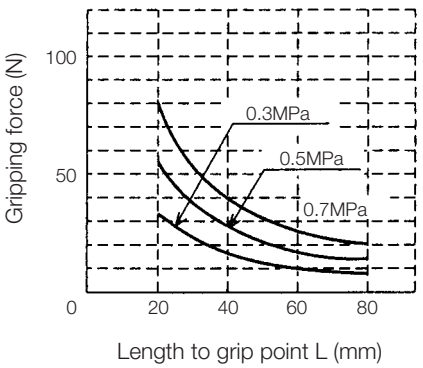
GVH-12



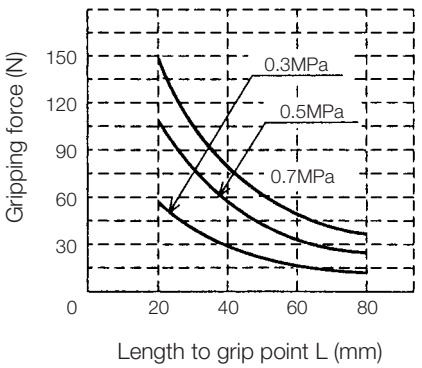
GVH-16



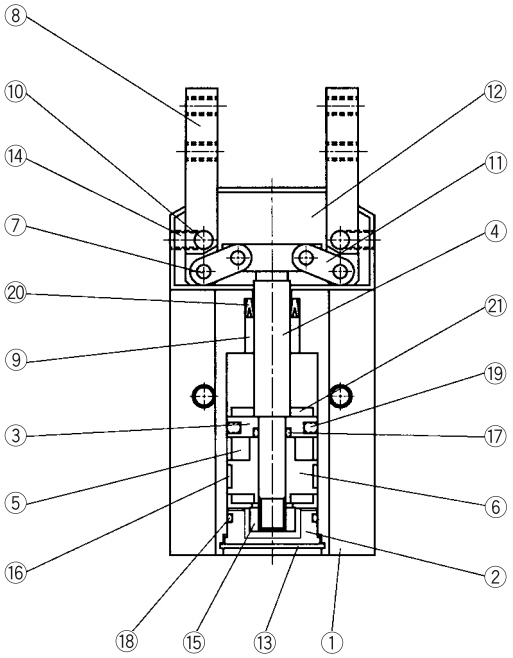
GVH-20



GVH-25



CONSTRUCTIONS AND MAIN PARTS



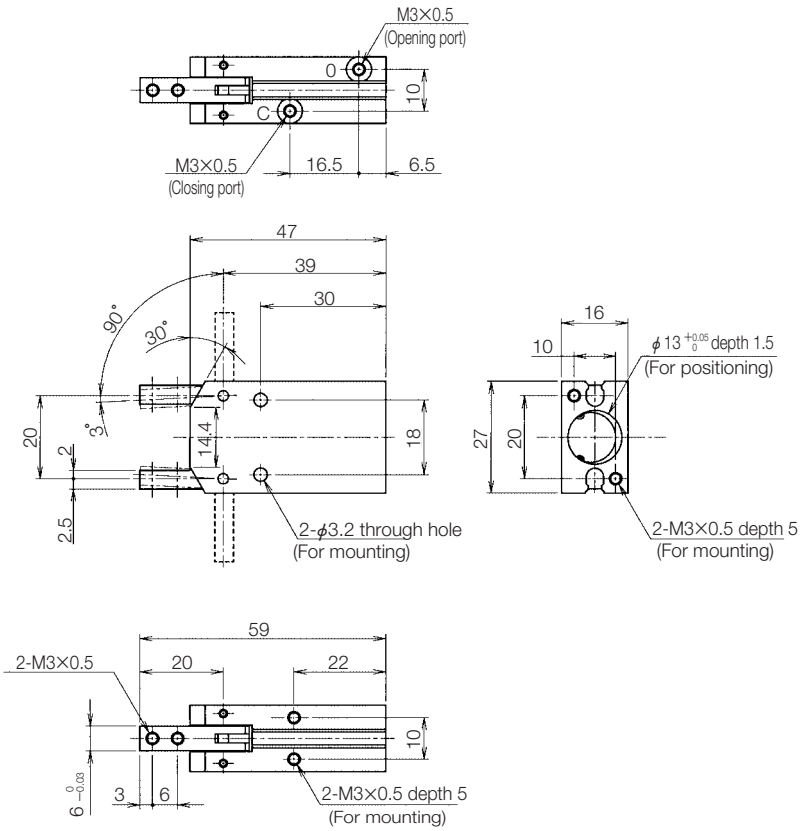
No.	Description	Material
1	Body	Aluminium alloy
2	Head cover	Aluminium alloy
3	Piston	Aluminium alloy
4	Piston rod	Stainless steel
5	Magnet	—
6	Hold-down cover	Aluminium alloy
7	Pres-fit pin	Carbon steel
8	Lever	Carbon tool steel
9	Metal	Sintered oil impregnated bearing
10	Fulcrum pin	Carbon tool steel
11	Link	Carbon steel
12	Slide plate	Carbon steel
13	Snap ring for hole	Hard steel
14	Hexagon socket head set screw	Chromium molybdenum steel
15	Hexagon nut	Chromium molybdenum steel
16	Wearing	Resin
17	O-ring	NBR
18	O-ring	NBR
19	Packing	NBR
20	Packing	NBR
21	Bumper	Urethane

※16 : Wearing is provided only for models of ϕ16 and ϕ20.
21 : Bumper is not provided for ϕ12.

DIMENSIONS

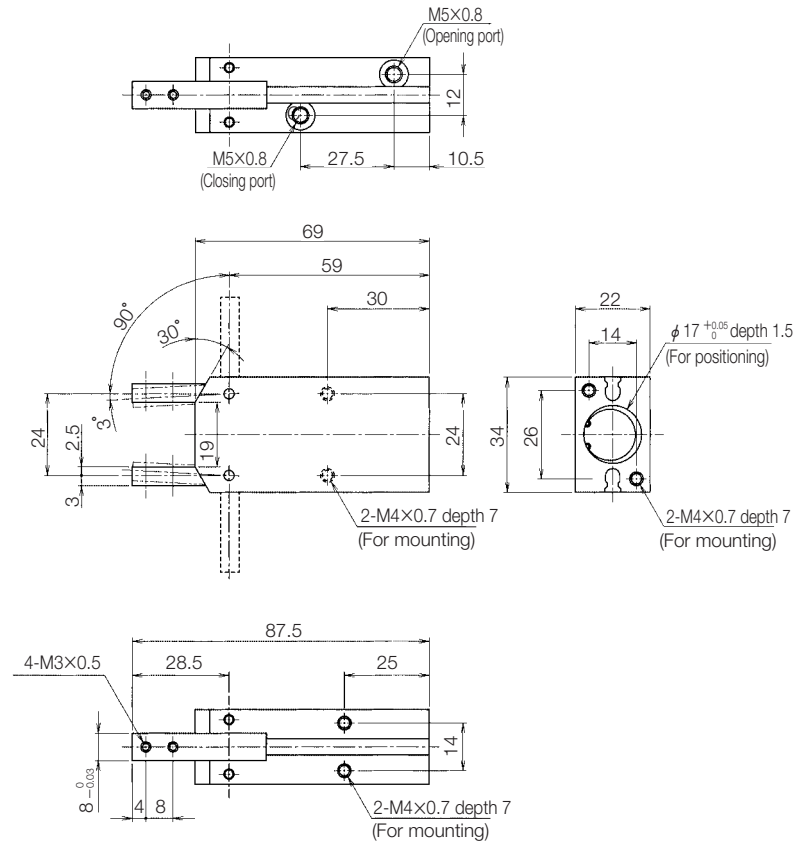
GVH-12

(Unit : mm)



GVH-16

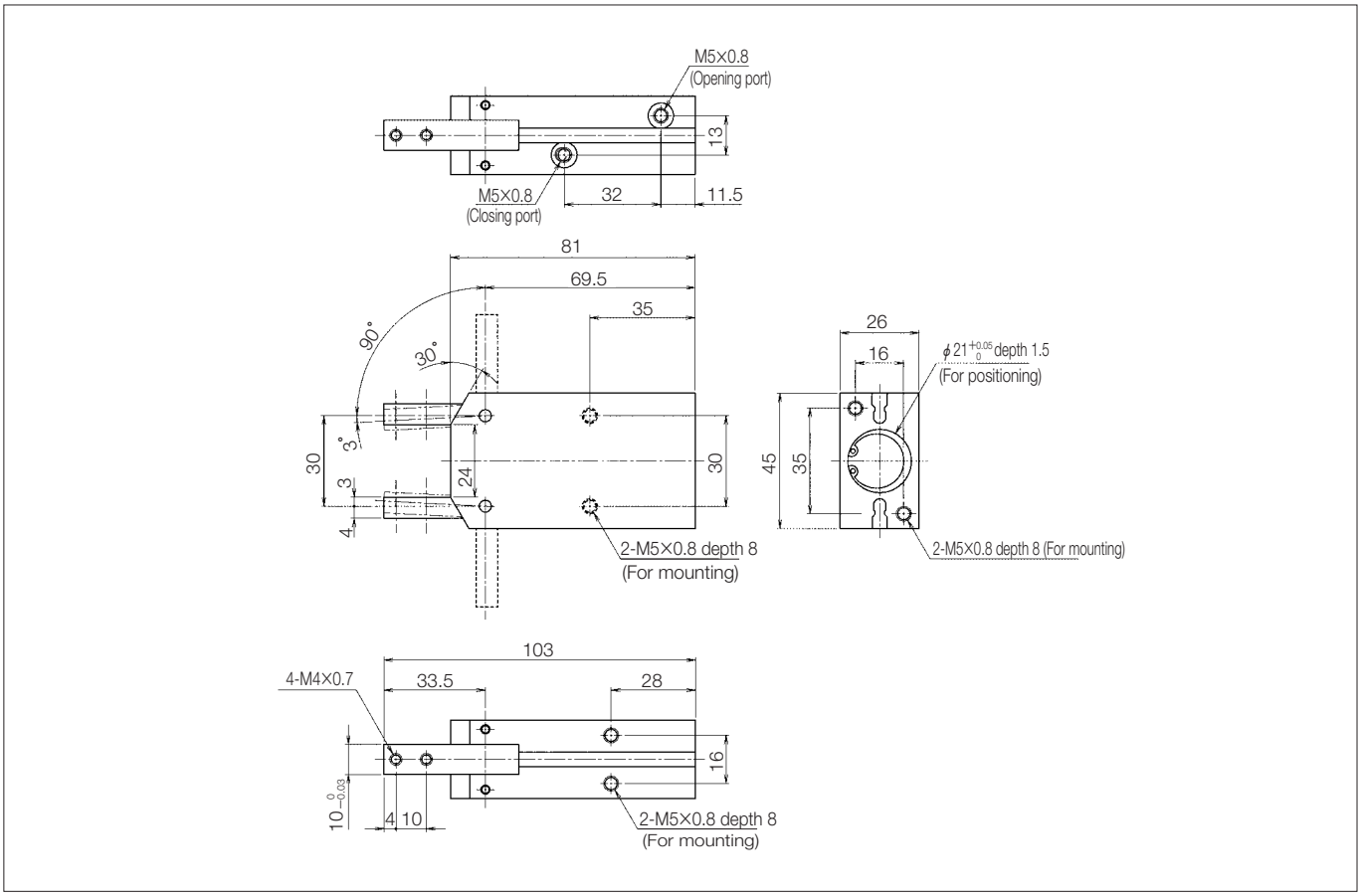
(Unit : mm)



DIMENSIONS

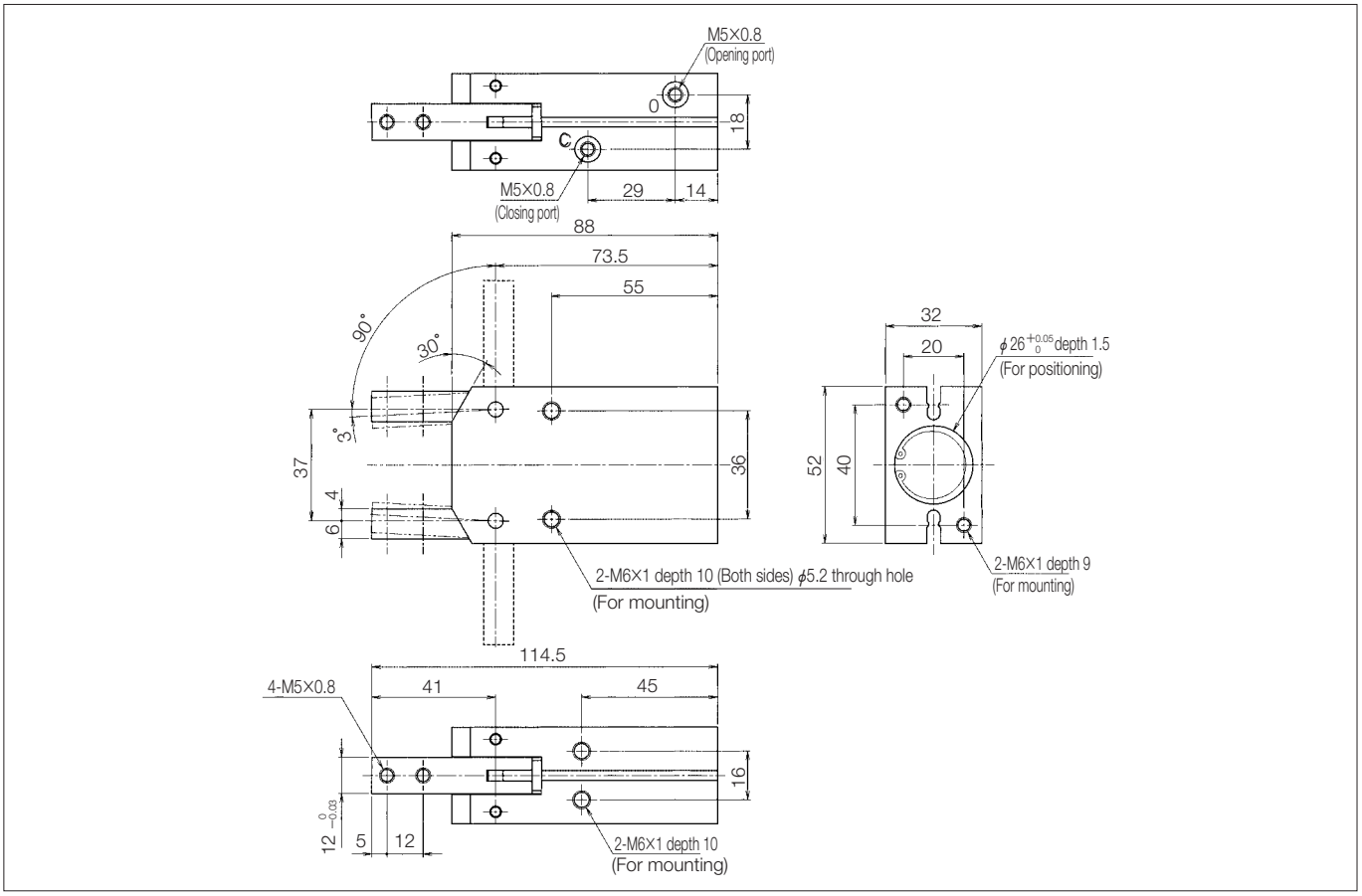
GVH-20

(Unit : mm)



GVH-25

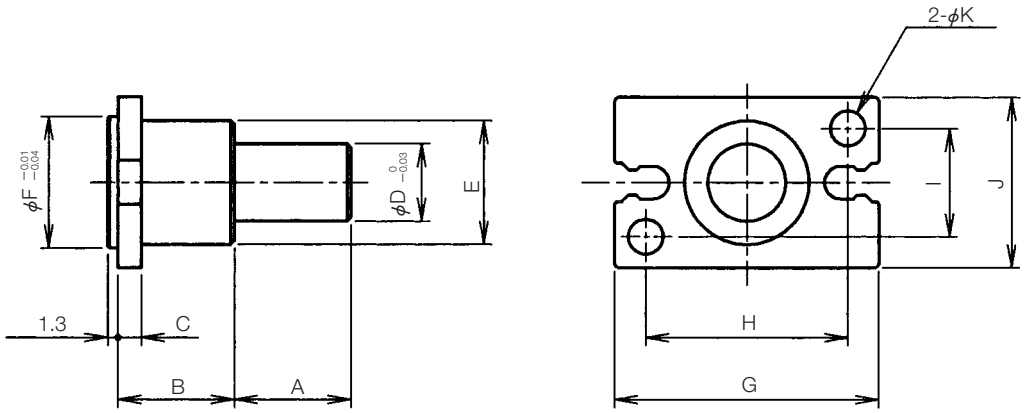
(Unit : mm)



ACCESSORIES

HAE TYPE ADAPTOR

Model No.	Applicable grippers
HAE- 8	GPCL-8、GVC-8
HAE-10	GPCR-10、GPCL-10、GVC-10
HAE-12	GVH-12
HAE-16	GPCR-16、GPCL-16、GVC-16、GVH-16
HAE-20	GPCR-20、GPCL-20、GVC-20、GVH-20
HAE-25	GPCR-25、GVC-25



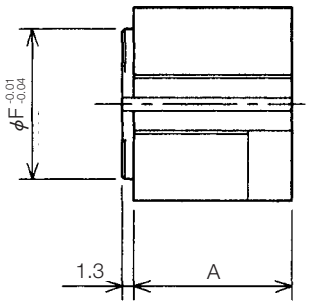
(Unit : mm)

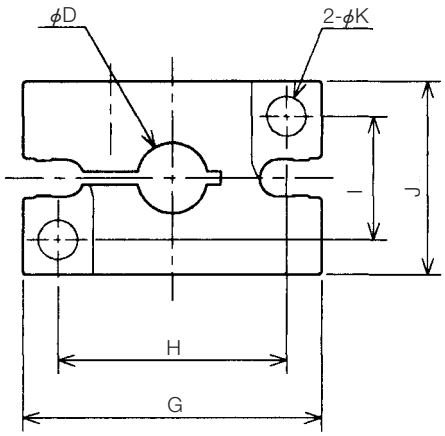
Model No.	A	B	C	D	E	F	G	H	I	J	K	Set bolt (2 pcs. supplied)	Mass (g)	Applicable cylinder ID
HAE- 8	10	10	3	8	10	9	20	15	9	13	2.8	M2.5×0.45×6	5	φ 8
HAE-10	15	15	3	10	11	11	23	17	10	16	3.4	M3×0.5×8	11	φ 10
HAE-12	15	15	3	10	12	13	27	20	10	16	3.4	M3×0.5×8	12	φ 12
HAE-16	15	15	3	10	16	17	34	26	14	22	4.5	M4×0.7×10	19	φ 16
HAE-20	15	15	3	10	18	21	45	35	16	26	5.5	M5×0.8×10	26	φ 20
HAE-25	25	17	5	14	26	26	52	40	20	32	6.6	M6×1×15	51	φ 25

(Note) Mass is that including the mass of 2 set bolts.

HFE TYPE ADAPTOR

Model No.	Applicable grippers
HFE-10	GPCR-10、GPCL-10、GVC-10
HFE-16	GPCR-16、GPCL-16、GVC-16、GVH-16
HFE-16L	GPCR-16、GPCL-16、GVC-16、GVH-16
HFE-20	GPCR-20、GPCL-20、GVC-20、GVH-20
HFE-25	GPCR-25、 GVC-25





(Unit : mm)

Model No.	A	D	F	G	H	I	J	K	Set bolt		Mass	Applicable
									For gripper (2 pcs.)	For adaptor (1 pc.)	(g)	cylinder ID
HFE-10	15	6	11	23	17	10	16	3.4	M3×0.5×8	M3×0.5×12	10	φ10
HFE-16	18	8	17	34	26	14	22	4.5	M4×0.7×12	M4×0.7×20	30	φ16
HFE-16L	18	10	17	34	26	14	22	4.5	M4×0.7×12	M4×0.7×20	28	φ16
HFE-20	19	13	21	45	35	16	26	5.5	M5×0.8×14	M4×0.7×30	47	φ20
HFE-25	22	13	26	52	40	20	32	6.6	M6×1×15	M5×0.8×30	82	φ25

(Note) Mass is that including the mass of 3 set bolts.

PARALLEL/ROTATING GRIPPER

ZE TYPE PROXIMITY SWITCH

SPECIFICATIONS

2-wire type

Model No.		Unit	ZE135	ZE235
Application			Relay, PLC, IC circuit	
Type of contact			NPN, transistor, open collector	
Load voltage		V	DC10～28	
Load current		mA	4～20	
Leak current (at DC24V, 25℃)		mA	1	
Internal voltage drop		V	max. 4.5	
Mean response time		ms	1	
Shock resistance		m/s^2	294 (Nonrepetitive)	
Ambient temperature range		℃	0～60	
Protection grade			IP67	
Indicator lamp			Red LED	
Lead wire	Color		Oil-resistant, white 2-core cord	
	Length	m	1 or 3	

(Note) For ZE135 and ZE235, load current is a value at surrounding temperature of 25 ℃.
This value fluctuates according to temperature and becomes 10 mA at 60 ℃.

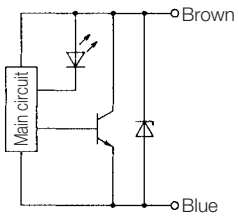
3-wire type

Model No.		Unit	ZE155	ZE255
Application			Relay, PLC, IC circuit	
Type of contact			NPN, transistor, open collector	
Power supply		V	DC4.5～28	
Load voltage		V	DC4.5～28	
Load current		mA	max. 50	
Consumed current		mA	max. 10	
Leak current (at DC24V, 25℃)		μA	50	
Internal voltage drop		V	max. 0.5	
Mean response time		ms	1	
Shock resistance		m/s^2	294 (Nonrepetitive)	
Ambient temperature range		℃	0～60	
Protection grade			IP67	
Indicator lamp			Red LED	
Lead wire	Color		Oil-resistant, white 2-core cord	
	Length	m	1 or 3	

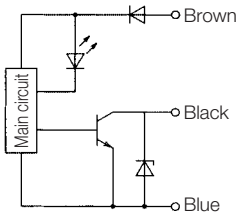
(Note) Value of internal voltage drop varies according to load current.
For ZE155 and ZE255, internal voltage drop is below 10 V at load current of 20 mA.

INTERNAL CIRCUIT

ZE135、ZE155



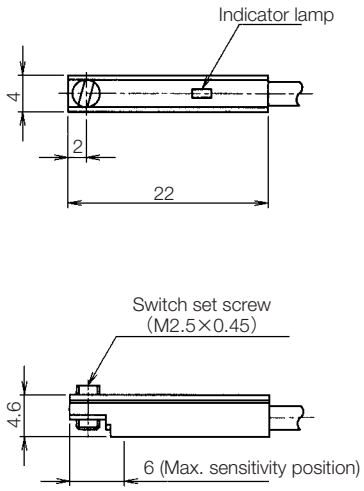
ZE235、ZE255



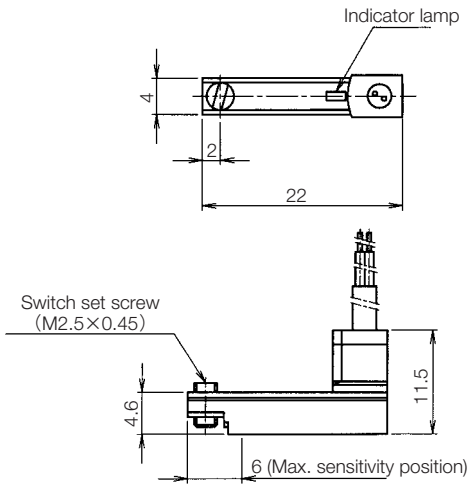
DIMENSIONS

(Unit : mm)

ZE135、ZE155



ZE235、ZE255



PARALLEL/ROTATING GRIPPER

HYSTERESIS AND POSITIONAL ACCURACY OF SWITCH

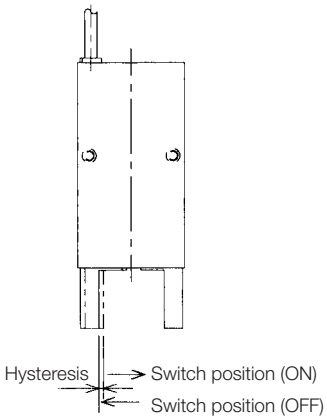
Hysteresis

The stroke difference (angle difference) between the position to which the finger on one side moves to turn on the switch and the position to which the finger moves in the opposite direction to turn off the switch is called "Hysteresis".

Positional accuracy of repetitive operation

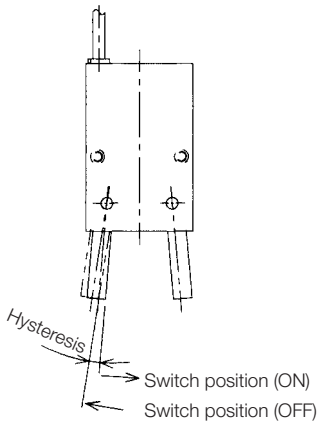
It means variations in the position at which the switch is turned on or off when the finger on one side is moved in a fixed direction.

Parallel gripper



Model No.	Hysteresis (mm)	Positional accuracy (mm)
GPCR-10	0.5	0.2
GPCR-16	0.6	
GPCR-20		
GPCR-25		
GPCL-8	0.5	0.2
GPCL-10		
GPCL-16	0.8	
GPCL-20		
GPCL-32		
GPCL-50		
GPDL-8	0.5	0.2
GPDL-12		
GPDL-14		
GPDL-18		
GPEL-8	0.5	0.2
GPEL-12		
GPK-12	0.6	0.2
GPK-16		
GPK-20	0.5	
GPK-25		

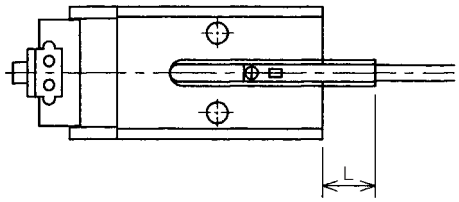
Rotating gripper



Model No.	Hysteresis (degree)	Positional accuracy (degree)
GVC-8	3.5	1.2
GVC-10	3.0	1.0
GVC-16	2.0	0.6
GVC-20		0.5
GVC-25	1.5	
GVH-12	3.0	0.5
GVH-16	1.5	
GVH-20	2.5	
GVH-25	1.5	

PROJECTION OF SWITCH

For GPCR and GPCL Series, the switch for detecting the full closing position of the finger projects from the end face of the body by an amount shown in the right Table.
Use it as a guide value for mounting the switch.

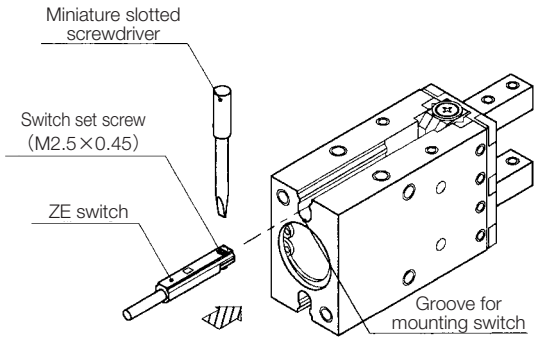


Model No.	Max. projection L (mm)
GPCL-8	9
GPCR-10	3
GPCL-10	
GPCR-16	2
GPCL-16	
GPCR-20	2
GPCL-20	
GPCR-25	0
GPCR-32	1
GPCL-50	0

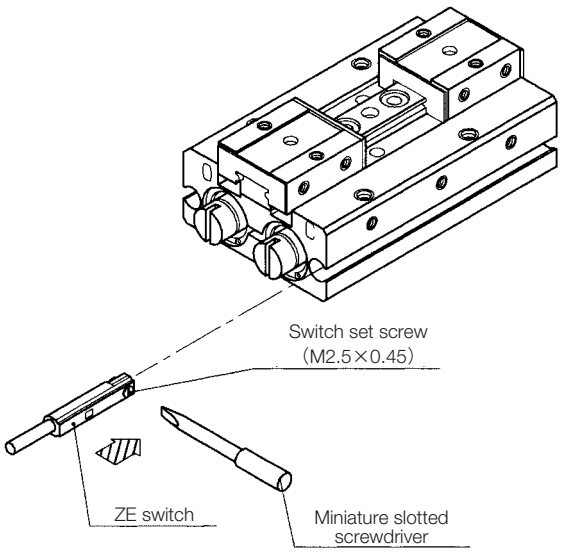
MOUNTING THE SWITCH

①Insert the switch into the groove for mounting it.
②Set a mounting position (detecting position), and then tighten the switch set screw with a miniature screwdriver.
③Set clamping torque at less than 0.1 N・m.

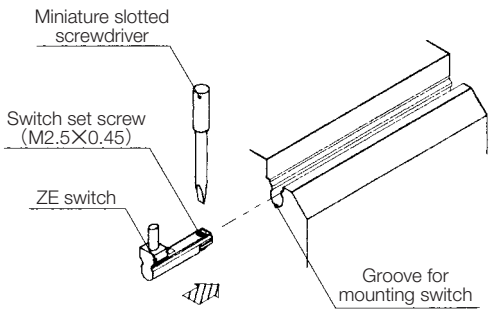
For GPCR, GPCL, GVC and GVH Series



For GPDL and GPEL Series



For GPK Series

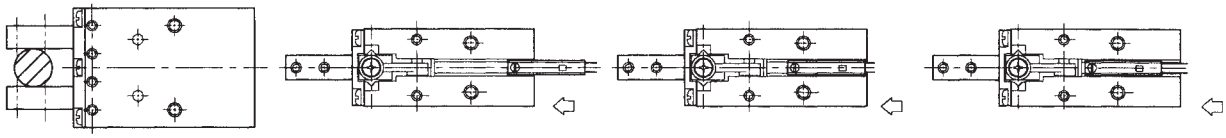


PARALLEL/ROTATING GRIPPER

HOW TO ADJUST SWITCH SET POSITION

Parallel Gripper

External gripping



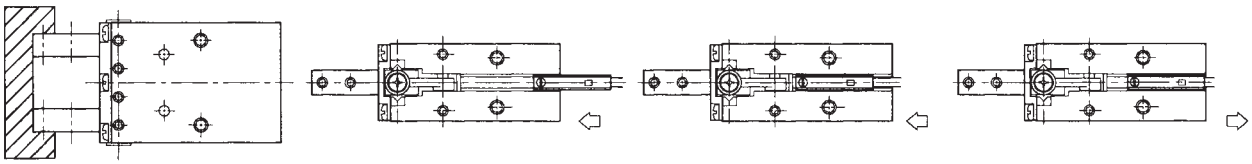
①Check external gripping of work and fully closed fingers.

②Fit switch into groove for mounting it from direction of arrow.

③When switch is put in direction of arrow, LED is on.

④Move switch in direction of arrow by 0.6 mm from position③ furthermore and fix it there with switch set screw.

Internal gripping



①Check internal gripping of work and fully opened fingers.

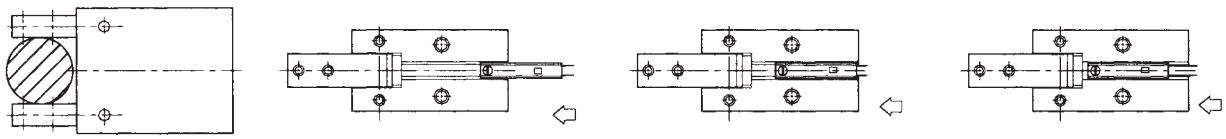
②Fit switch into groove for mounting it from direction of arrow.

③When switch is put in direction of arrow, LED is on, and when switch is moved furthermore, LED is off.

④Move back switch in direction of arrow (reverse) by 0.6 mm furthermore until LED is on, and fix it there.

Rotating Gripper

External gripping



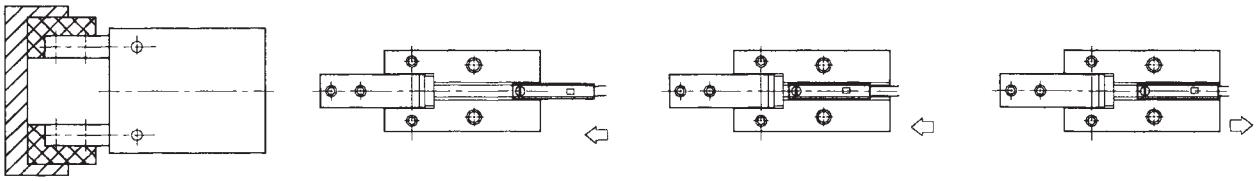
①Check external gripping of work and fully closed fingers.

②Fit switch into groove for mounting it from direction of arrow.

③When switch is put in direction of arrow, LED is on.

④Move switch in direction of arrow by 0.6 mm from position③ furthermore and fix it there with switch set screw.

Internal gripping



①Check internal gripping of work and fully opened fingers.

②Fit switch into groove for mounting it from direction of arrow.

③When switch is put in direction of arrow, LED is on, and when switch is moved furthermore, LED is off.

④Move back switch in direction of arrow (reverse) by 0.6 mm furthermore until LED is on, and fix it there.

(Note) ①Shows the position at which to check that the switch is turned on. Adjust the switch in order of ① to ④ and then mount it.

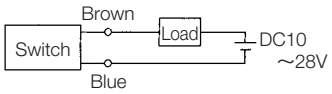
HOW TO CONNECT THE SWITCH

⚠ CAUTION

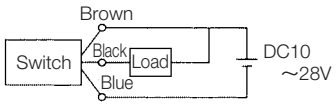
- Connect the switch properly in accordance with the color of each lead wire
  Be sure to turn off the electric circuit on the connecting side beforehand.

Basic connection

ZE135、ZE235

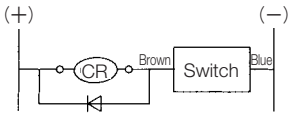


ZE155、ZE255

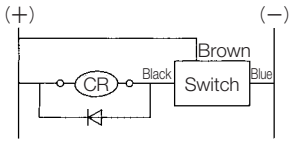


Connection to relay

ZE135、ZE235

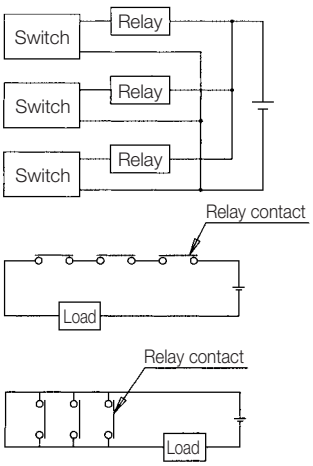


ZE155、ZE255



AND (series) connection, OR (parallel) connection

ZE135、ZE235



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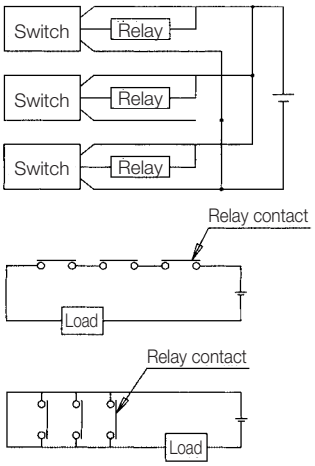
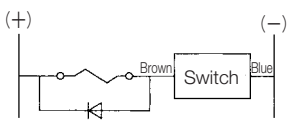
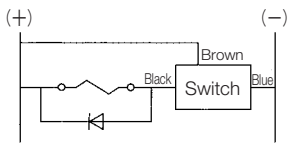


ZE135、ZE235

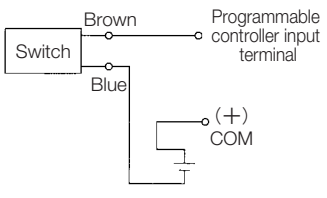


ZE155、ZE255

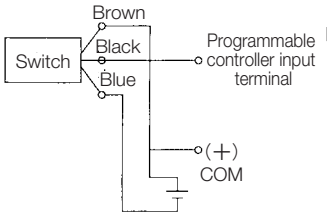


Connection to PLC

ZE135、ZE235



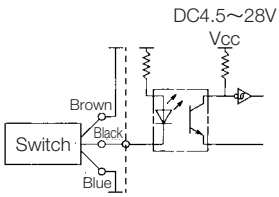
ZE155、ZE255



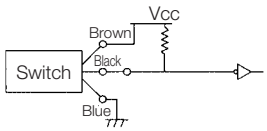
Connection to TTL

ZE155、ZE255

Separate connection

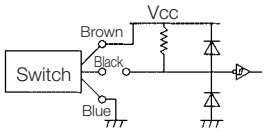


Direct connection



Connection to C-MOS

ZE155、ZE255



⚠ WARNING

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