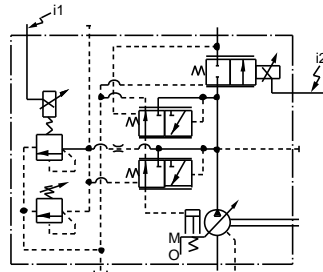
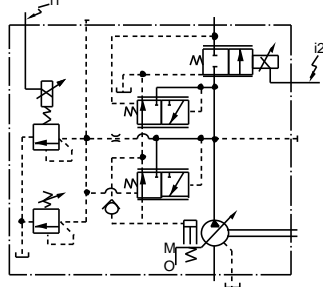


Model Number Designation

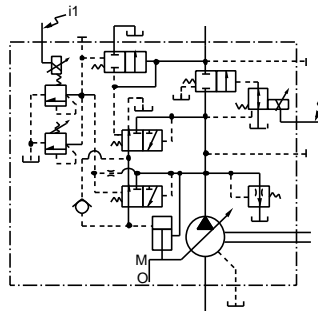
Graphic Symbols



A16/A22/A37

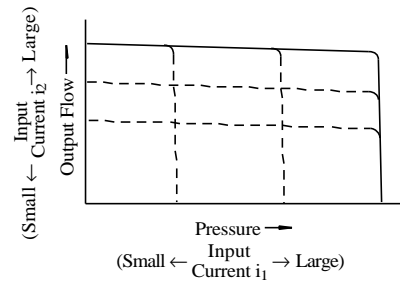


A56



A70/A90/A145

Performance Characteristics



Model Number Designation

| A56 | -F | -R | -04 | -C | -K | -32 | * |
|---|--|--|---|--|--------------------------|---------------|-------------|
| Series Number | Mounting | Direction of Rotation | Control Type | Pres. Adj. Range MPa (PSI) | Shaft Extension | Design Number | Design Std. |
| A16 (15.8 cm ³ /rev) | F: Flange Mtg. L: Foot Mtg. | (Viewed from Shaft End) R: ★1 Clockwise | 04: Proportional Electro-Hydraulic Load Sensing | B: 1.5 - 7 (220 - 1020) C: 1.5 - 16 (220 - 2320) H: 1.5 - 21 (220 - 3050) | K: Keyed Shaft | 32 | Refer to ★2 |
| A22 (22.2 cm ³ /rev) | | | | B: 1.5 - 7 (220 - 1020) C: 1.5 - 16 (220 - 2320) | | 32 | |
| A37 (36.9 cm ³ /rev) | | | | B: 2 - 7 (290 - 1020) C: 2 - 16 (290 - 2320) H: 2 - 21 (290 - 3050) | | 32 | |
| A56 (56.2 cm ³ /rev) | | | | 32 | | | |

| A70 | -F | R | 04 | C | S | -60 | * |
|---|--|--|---|--|------------------------|---------------|-------------|
| Series Number | Mounting | Direction of Rotation | Control Type | Pres. Adj. Range MPa (PSI) | Port Position | Design Number | Design Std. |
| A70 (70.0 cm ³ /rev) | F: Flange Mtg. L: Foot Mtg. | (Viewed from Shaft End) R: ★1 Clockwise | 04: Proportional Electro-Hydraulic Load Sensing | C: 1.5 - 16 (220 - 2320) H: 1.5 - 21 (220 - 3050) | S: Side Port | 60 | Refer to ★2 |
| A90 (91.0 cm ³ /rev) | | | | | | 60 | |
| A145 (145 cm ³ /rev) | | | | | | 60 | |

★1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.
 ★2. Design Standards: None..... Japanese Standard "JIS"
 80..... European Design Standard
 90..... N. American Design Standard

■ Pipe Flange Kits

Pipe flange kits are available.

When ordering, specify the kit number from the table below.

| Pump Model Numbers | Name of Port | Pipe Flange Kit Numbers | | | | | | |
|--------------------------|--------------|-------------------------|--------------------------|-----------------------------|--|-----------------------------|--|-----------------------------|
| | | Threaded Connection | | | Socket Welding ^{*1} | | Butt Welding | |
| | | Japanese Standard "JIS" | European Design Standard | N. American Design Standard | Japanese Standard "JIS" & European Design Standard | N. American Design Standard | Japanese Standard "JIS" & European Design Standard | N. American Design Standard |
| A16-∗-R-04 A22-∗-R-04 | Suction | F5-06-A-10 | F5-06-A-1080 | F5-06-A-1090 | F5-06-B-10 | F5-06-B-1090 | F5-06-C-10 | F5-06-C-1090 |
| | Discharge | — ^{*2} | — ^{*2} | — ^{*2} | — ^{*2} | — ^{*2} | — ^{*2} | — ^{*2} |
| A37-∗-R-04 A56-∗-R-04 | Suction | F5-10-A-10 | F5-10-A-1080 | F5-10-A-1090 | F5-10-B-10 | F5-10-B-1090 | F5-10-C-10 | F5-10-C-1090 |
| | Discharge | F5-06-A-10 | F5-06-A-1080 | F5-06-A-1090 | F5-06-B-10 | F5-06-B-1090 | F5-06-C-10 | F5-06-C-1090 |
| A70-∗R04 | Suction | F5-12-A-10 | F5-12-A-1080 | F5-12-A-1090 | F5-12-B-10 | F5-12-B-1090 | F5-12-C-10 | F5-12-C-1090 |
| | Discharge | F5-10-A-10 | F5-10-A-1080 | F5-10-A-1090 | F5-10-B-10 | F5-10-B-1090 | F5-10-C-10 | F5-10-C-1090 |
| A90-∗R04 A145-∗R04 | Suction | F5-16-A-10 | F5-16-A-1080 | F5-16-A-1090 | F5-16-B-10 | F5-16-B-1090 | F5-16-C-10 | F5-16-C-1090 |
| | Discharge | F5-10-A-10 | F5-10-A-1080 | F5-10-A-1090 | F5-10-B-10 | F5-10-B-1090 | F5-10-C-10 | F5-10-C-1090 |

★ 1. In case of using socket welding flanges, there is a case where the operating pressure should be set lower than the normal because of strength of the flanges. Therefore, please pay cautious attention to the operating pressure when the socket welding flanges are used.

★ 2. Discharge port for pump model "A16" and "A22" is available only the threaded connections.

- Detail of the pipe flange kits are given in the Catalogue No. Pub. EC-3001.

■ Instructions

● Bleeding Air

In order to get steadily controlled pressure and flow, bleed air by loosening the air vent screw and fill solenoid armature with operating oil.

● Manual Adjustment Screws

Manual adjustment screws may be used for initial running adjustment or in case of electrical failures in order to adjust pressure and flow temporarily. In case of normal use, put the manual adjustment screws back in their preset positions.

● Position of Cable Departure

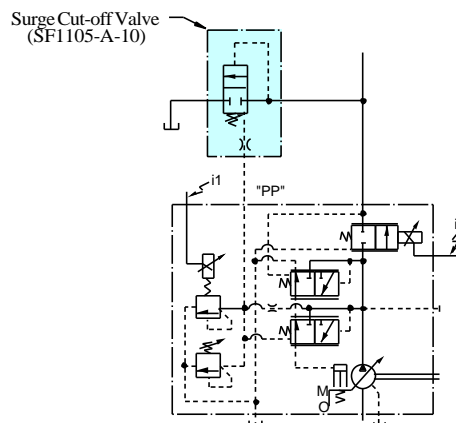
Position of cable departure can be changed. For details, refer to EDG-01 valve Catalogue No. Pub. EC-1302.

● Connection of Surge Cut-off Valve to "A" Series Pump (For A16 to A56 Type)

If using surge cut-off valve (SF1105-A-10), connect between pilot port "PP" of this pump and port "PP" of surge cut-off valve as pilot piping (refer to drawing below).

Inside diameter of pipe should be more than 8 mm (.32 in.).

Consult Yuken of detail of surge cut-off valve.



Specifications

| Descriptions | | Model No. | A16 | A22 | A37 | A56 | A70 | A90 | A145 | |
|--|---|---------------------------------------|--|------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--|
| Geometric Displacement | | cm ³ /rev (cu. in./rev) | 15.8 (.964) | 22.2 (1.355) | 36.9 (2.25) | 56.2 (3.43) | 70.0 (4.27) | 91.0 (5.55) | 145 (8.85) | |
| Operating Pres. MPa (PSI) | Rated ^{*2} | | 16 (2320) | 16 (2320) | 16 (2320) | 16 (2320) | 21 (3050) | 21 (3050) | 21 (3050) | |
| | Intermittent ^{*1} | | 21 (3050) | 16 (2320) | 21 (3050) | 21 (3050) | 21 (3050) | 21 (3050) | 21 (3050) | |
| Shaft Speed Range r/min | Max. | | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | |
| | Min. | | 600 | 600 | 600 | 600 | 600 | 600 | 600 | |
| Flow Control | Flow Adj. Range | L/min (U.S. GPM) | 1 - 28.4 (.26 - 7.5) | 1 - 40 (.26 - 10.6) | 1 - 66 (.26 - 17.4) | 1 - 101 (.26 - 26.7) | 1 - 126 (.26 - 33.3) | 1 - 163 (.26 - 43.1) | 2 - 261 (.53 - 69.0) | |
| | Min Pres. Required for Flow Adj. | MPa (PSI) | 1.5 (220) | 1.5 (220) | 1.5 (220) | 2.0 (290) | 1.0 (145) | 1.0 (145) | 1.0 (145) | |
| | Differential Pres. (Discharge Pres. - Load Pres.) | MPa (PSI) | 0.37 (55) | | | | 0.22 (30) | | | |
| | Step Response ^{*5} (0 → Max. Flow) | ms | 70 | 80 | 120 | 125 | 100 | 120 | 210 | |
| | Hysteresis | | Less than 3% ^{*4} | | | | | | | |
| | Rated Current | mA | 900 | 700 | 740 | 790 | 820 | 920 | 920 | |
| | Coil Resistance [20蛸 (68蛸)] | Ω | 10 | | | | | | | |
| Pres. Control | Pres. Adj. Range | MPa (PSI) | Refer to Model Number Designation | | | | | | | |
| | Step Response ms | t ₁ ^{*5} | 80 | 80 | 50 | 55 | 150 | 150 | 160 | |
| | | t ₂ ^{*5} | 140 | 90 | 80 | 80 | 80 | 120 | 180 | |
| | Hysteresis | | Less than 2% ^{*4} | | | | | | | |
| | Rated Current | mA | (Pres. Adj. Range) B: 770, C:880, H:790 | | | | C:860 H: 765 | C:873 H: 765 | C:875 H: 755 | |
| Coil Resistance [20蛸 (68蛸)] | Ω | 10 | | | | | | | | |
| Applicable Amplifier Model ^{*3} | | | AME-D2-1010-* -10 | | | | | | | |
| Approx. Mass kg (lbs.) | Flange Mtg. | 32 (70.6) | 32 (70.6) | 38 (83.8) | 45 (99.2) | 72.5 (160) | 88.5 (195) | 109.5 (241) | | |
| | Foot Mtg. | 34.2 (75.4) | 34.2 (75.4) | 43.2 (95.3) | 49.3 (109) | 84.5 (186) | 109 (240) | 134.5 (297) | | |

- ★1. Whenever setting pressure, make sure the full cut-off pressure never exceeds the maximum intermittent pressure.
- ★2. When operating the pump exceeding the rated pressure, operating conditions are restricted. Refer to page 6 for the details.
- ★3. For detail specifications of power amplifiers, refer to Catalogue No. Pub. EC-1305.
- ★4. The figure mentioned in the above table are those obtained using Yuken's amplifier.
- ★5. Step response depends on circuit and operating conditions. Data shown in the table above is an example based on the condition right.

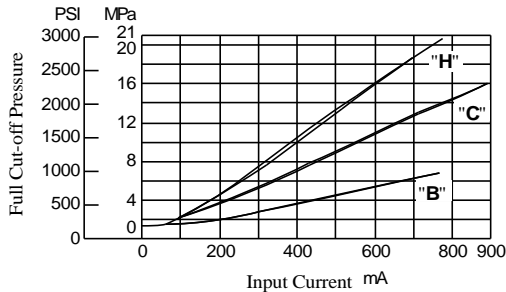
| Model | Pres. Step Response | | Loading Volume |
|------------------|----------------------------------|----------------------------------|---|
| | t ₁ | t ₂ | |
| A16, A22 | 1.5 → 16 MPa (220 → 2320 PSI) | 16 → 1.5 MPa (2320 → 220 PSI) | High Pressure Hose 3/8" × 2 m (6.6 ft) |
| A37, A56 | 2.0 → 16 MPa (290 → 2320 PSI) | 16 → 2.0 MPa (2320 → 290 PSI) | High Pressure Hose 3/4" × 2 m (6.6 ft) |
| A70, A90 A145 | 3.0 → 16 MPa (435 → 2320 PSI) | 16 → 3.0 MPa (2320 → 435 PSI) | High Pressure Hose 1-1/4" × 2 m (6.6 ft) |

Typical Pump Characteristics

Typical Performance Characteristics at Viscosity 20 mm²/s (100 SSU) [ISO VG32 Oils, 50℃ (122℉)]

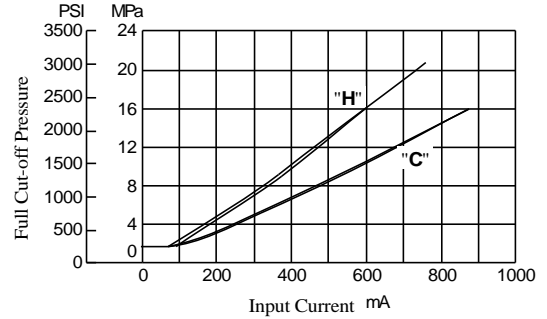
Full Cut-off Pres. vs. Input Current

● A16/A22/A37/A56



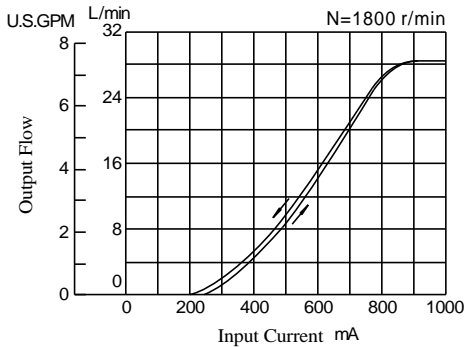
Note: Pressure adjustment range "H" is not available for A22.

● A70/A90/A145

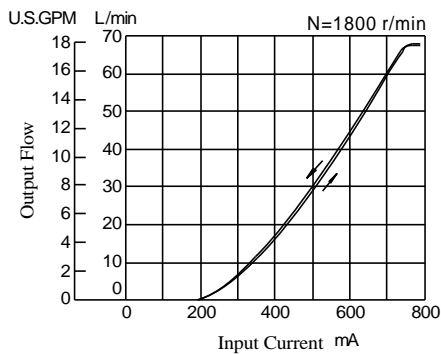


Output Flow vs. Input Current

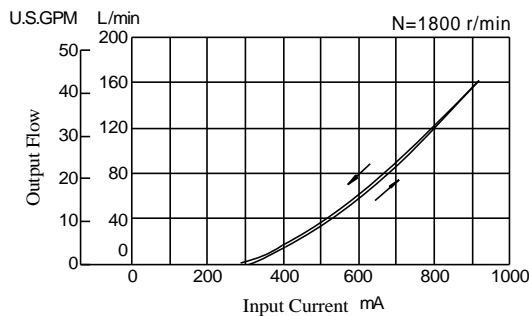
● A16



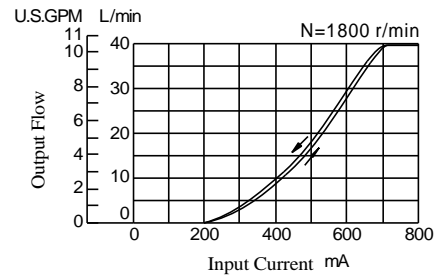
● A37



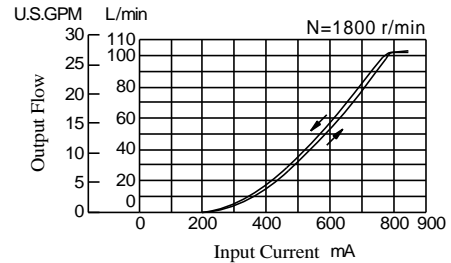
● A90



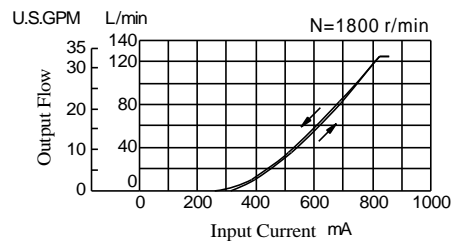
● A22



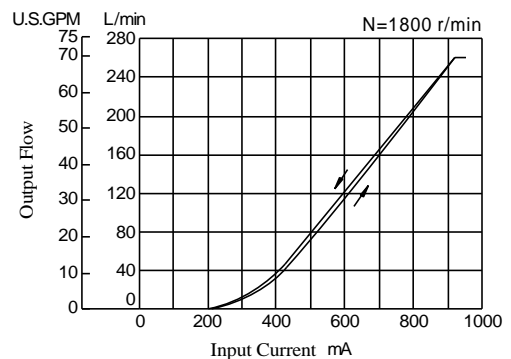
● A56



● A70

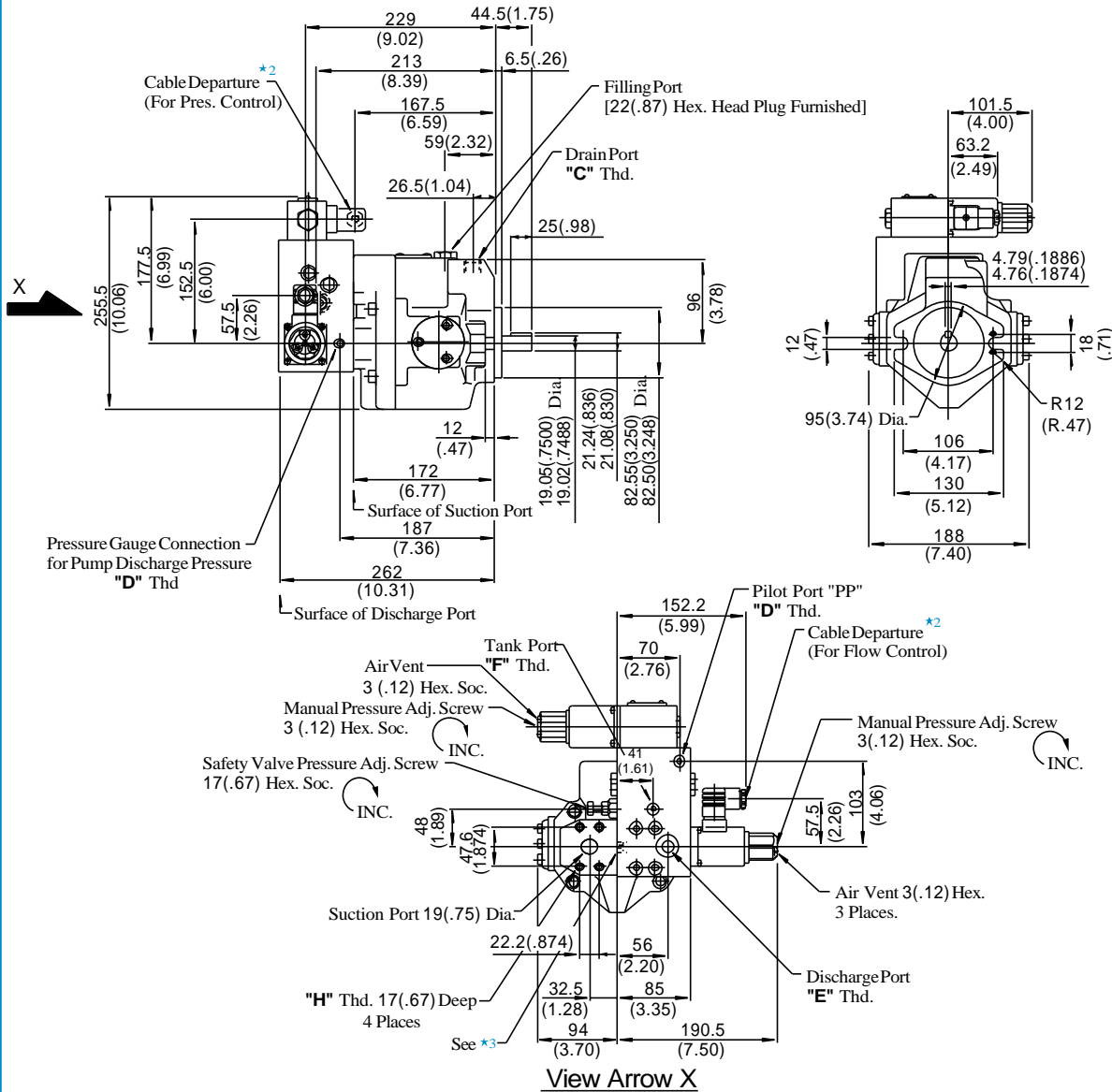


● A145



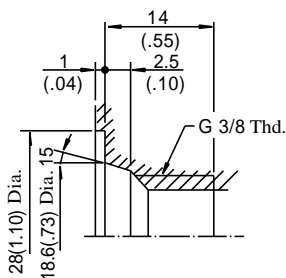
Installation Drawing

Flange Mtg : A16-F-R-04-**-K-32/3280/3290
A22-F-R-04-**-K-32/3280/3290



| Model Numbers | "C" Thd. | "D" Thd. | "E" Thd. | "F" Thd. | "H" Thd. |
|------------------------|-----------|------------|-----------|-----------|------------|
| A16/A22-F-R-04-**-K-32 | Rc 3/8 | Rc 1/4 | G 3/8*1 | Rc 1/4 | M10 |
| A16/A22-F-R-04-**-K- | 3/8 BSP.F | 1/4 BSP.Tr | 3/8 BSP.F | 1/4 BSP.F | |
| 3280 | 3/8 NPT | 1/4 NPT | 3/8 NPT | 1/4 NPT | 3/8-16 UNC |

★ 1. Detail of Discharge Ports
[For Japanese Standard]



★ 2. Cable Applicable:
Outside Dia.....8-10 mm (.31-.39 IN.)
Conductor Area.....Not Exceeding 1.5 mm² (.002 Sq. IN.)

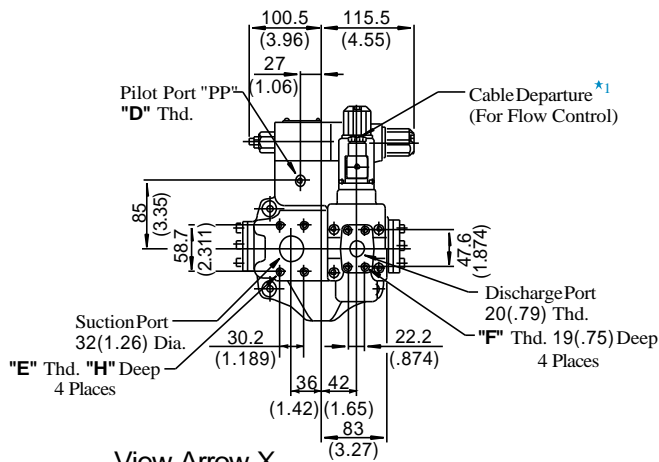
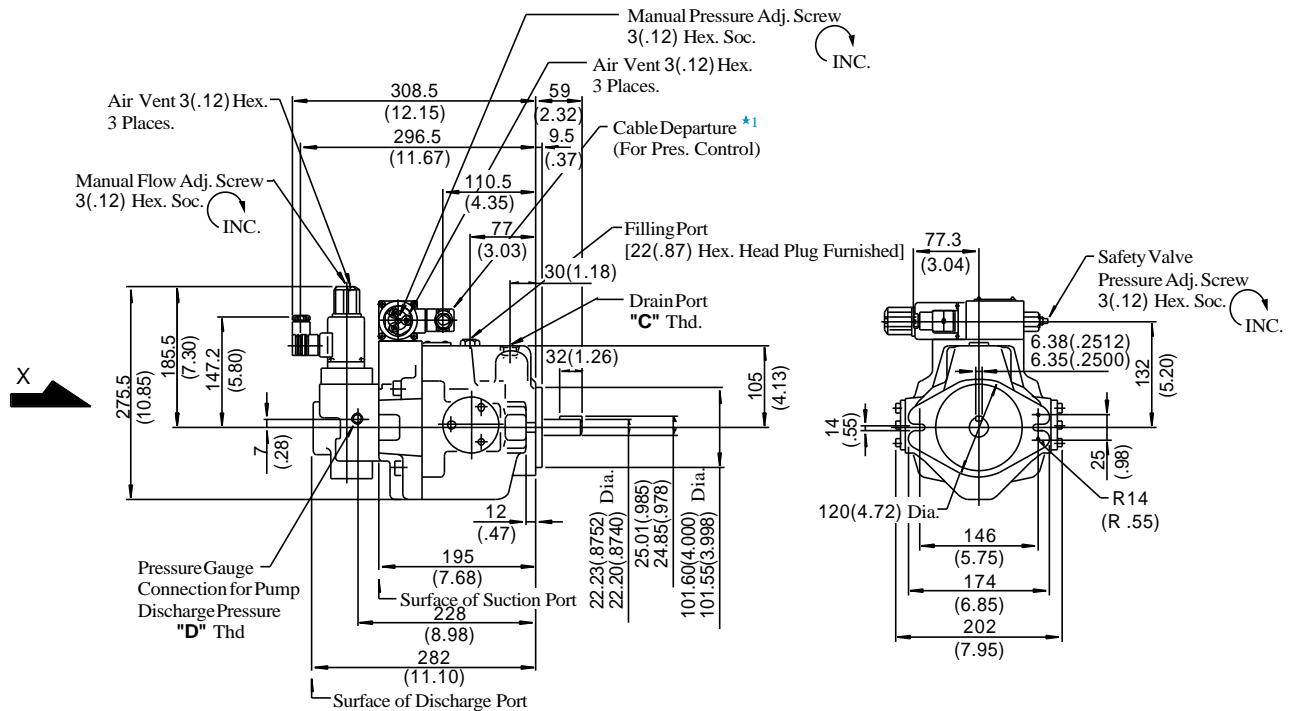
★ 3. Do not touch the screw because it is adjusted at the time of shipment.

DIMENSIONS IN
MILLIMETRES (INCHES)

● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model. Refer to page 18 for the dimensions of mounting bracket.

Flange Mtg. : A37-F-R-04-***-K-32/3280/3290

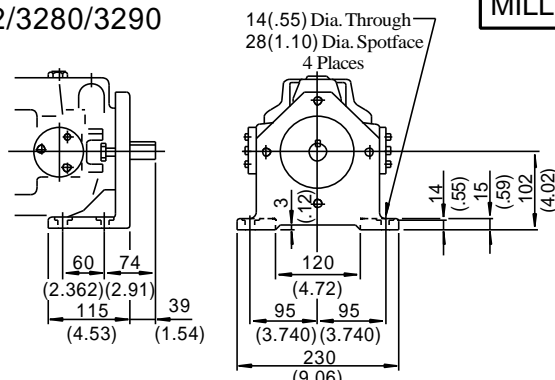


★ 1. Cable Applicable:
Outside Dia.....8-10 mm (.31-.39 IN.)
Conductor Area.....Not Exceeding 1.5 mm² (.002 Sq. IN.)

| Model Numbers | "C" Thd. | "D" Thd. | "E" Thd. | "F" Thd. | "H" mm (IN.) |
|----------------------------|----------|-----------|-------------|------------|--------------|
| A37-F-R-04- <i>*</i> -K-32 | Rc 1/2 | Rc 1/4 | M10 | M10 | 19 (.75) |
| A37-F-R-04- <i>*</i> -K- | 1/2BSP.F | 1/4BSP.Tr | | | |
| 3280 | 1/2 NPT | 1/4 NPT | 7/16-14 UNC | 3/8-16 UNC | 20 (.79) |

DIMENSIONS IN
MILLIMETRES (INCHES)

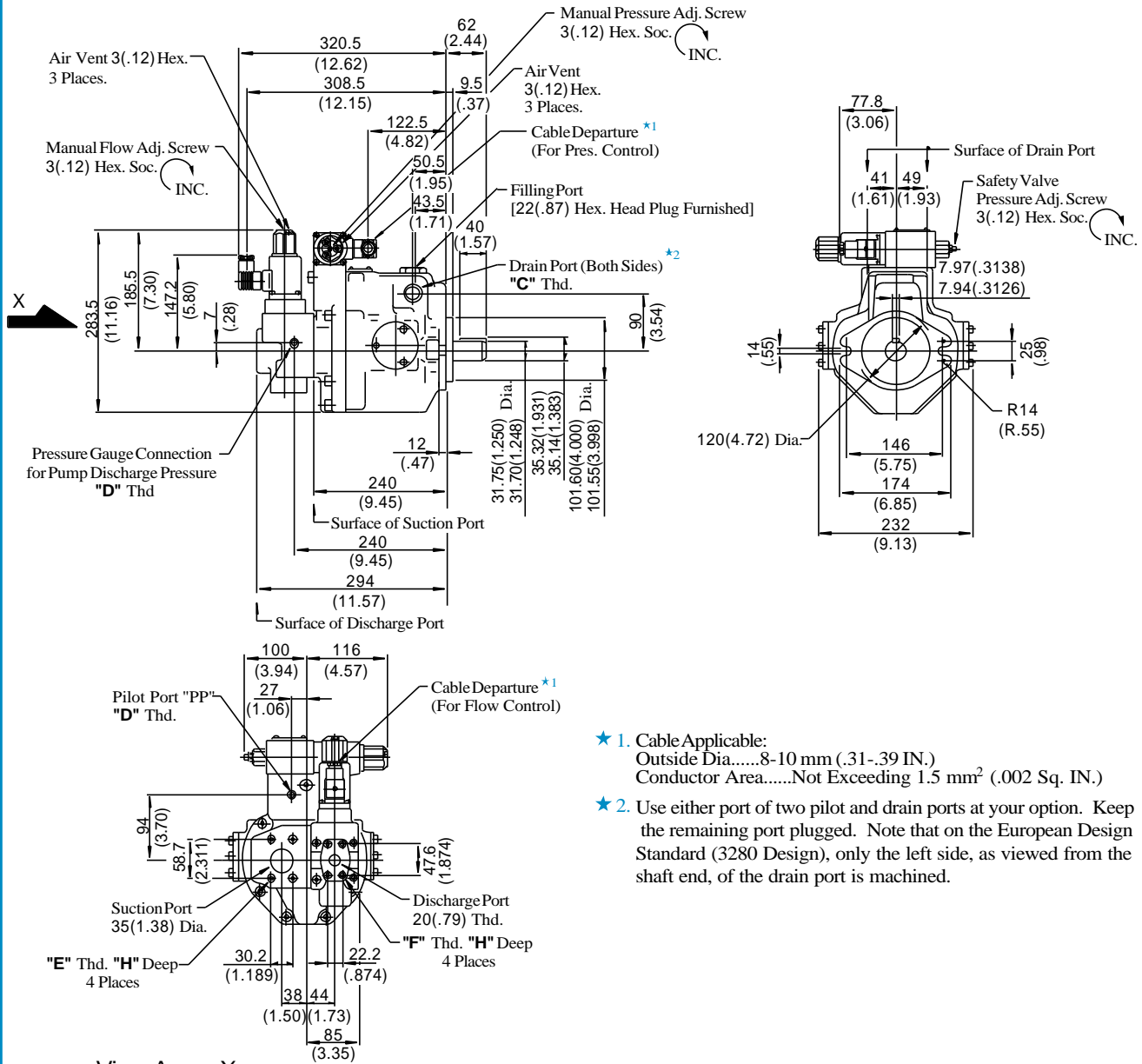
Foot Mtg. : A37-L-R-04-***-K-32/3280/3290



• For other dimensions, refer to "Flange Mtg.".

Installation Drawing

Flange Mtg. : A56-F-R-04-***-K-32/3280/3290



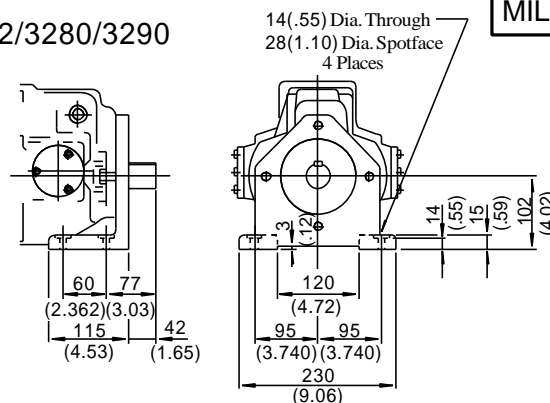
- ★ 1. Cable Applicable:
 Outside Dia.....8-10 mm (.31-.39 IN.)
 Conductor Area.....Not Exceeding 1.5 mm² (.002 Sq. IN.)
- ★ 2. Use either port of two pilot and drain ports at your option. Keep the remaining port plugged. Note that on the European Design Standard (3280 Design), only the left side, as viewed from the shaft end, of the drain port is machined.

View Arrow X

| Model Numbers | "C" Thd. | "D" Thd. | "E" Thd. | "F" Thd. | "H" mm (IN.) |
|----------------------------|-----------|------------|-------------|------------|--------------|
| A56-F-R-04- <i>*</i> -K-32 | Rc 3/4 | Rc 1/4 | M10 | M10 | 19 (.75) |
| A56-F-R-04- <i>*</i> -K- | 3/4 BSP.F | 1/4 BSP.Tr | | | |
| 3280 | 3/4 NPT | 1/4 NPT | 7/16-14 UNC | 3/8-16 UNC | 20 (.79) |

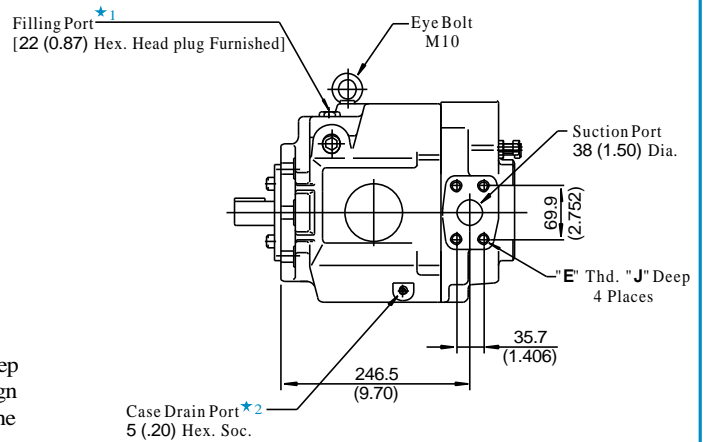
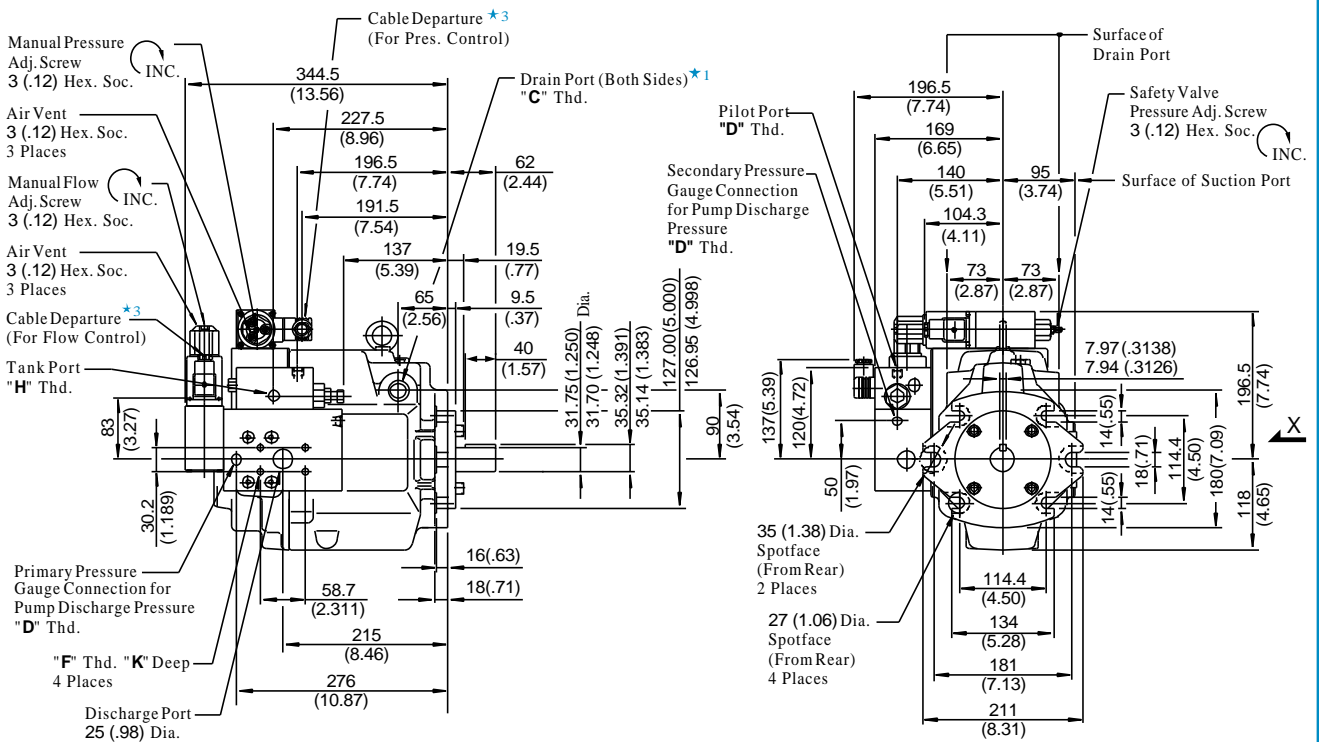
DIMENSIONS IN MILLIMETRES (INCHES)

Foot Mtg. : A56-L-R-04-***-K-32/3280/3290



• For other dimensions, refer to "Flange Mtg.".

Flange Mtg. : A70-FR04*S-60/6080/6090



View Arrow X

- ★ 1. Use either port of two pilot and drain ports at your option. Keep the remaining port plugged. Note that on the European Design Standard (6080 Design), only the left side, as viewed from the shaft end, of the drain port is machined.
- ★ 2. Case drain port is available for use when draining hydraulic fluid from pump casing.
- ★ 3. Cable Applicable:
Outside Dia.....8-10 mm (.31-.39 IN.)
Conductor Area.....Not Exceeding 1.5 mm² (.002 Sq. IN.)

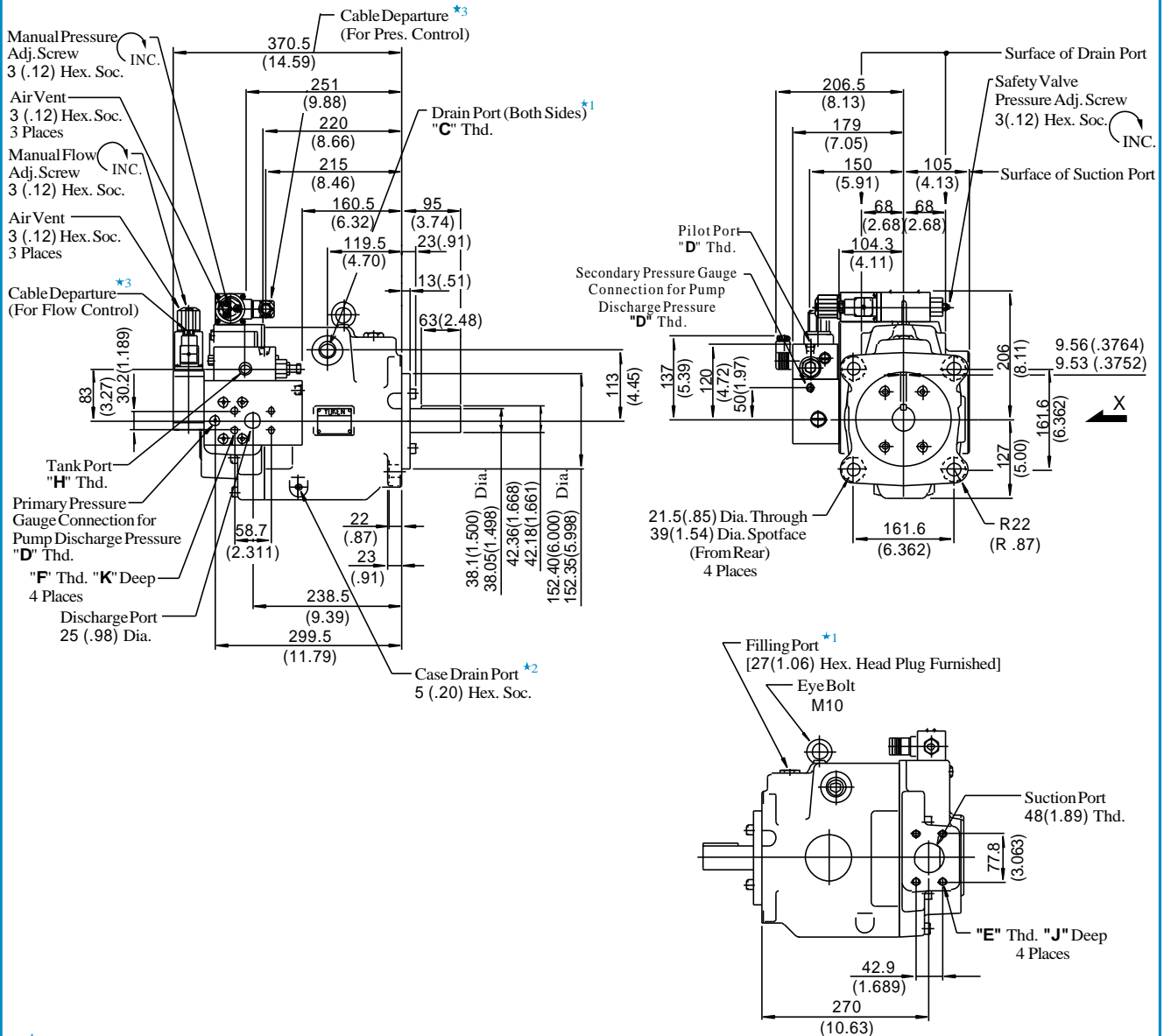
| Model Numbers | "C" Thd. | "D" Thd. | "E" Thd. | "F" Thd. | "H" Thd. | J mm (IN.) | K mm (IN.) |
|---------------|----------|-----------|------------|-------------|----------|------------|------------|
| A70-FR04*S-60 | Rc 3/4 | Rc 1/4 | M12 | M10 | Rc 3/8 | 19 (.75) | 17 (.67) |
| A70-FR04*S- | 3/4BSP.F | 1/4BSP.Tr | | | 3/8BSP.F | | |
| 6080 | 3/4 NPT | 1/4 NPT | 1/2-13 UNC | 7/16-14 UNC | 3/8 NPT | 21 (.83) | 20 (.79) |

DIMENSIONS IN
MILLIMETRES (INCHES)

● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model. Refer to page 21 for the dimensions of mounting bracket.

Flange Mtg. : A90-FR04*S-60/6080/6090



View Arrow X

- *1. Use either port of two pilot and drain ports at your option. Keep the remaining port plugged. Note that on the European Design Standard (6080 Design), only the left side, as viewed from the shaft end, of the drain port is machined.
- *2. Case drain port is available for use when draining hydraulic fluid from pump casing.
- *3. Cable Applicable:
Outside Dia.....8-10 mm (.31-.39 IN.)
Conductor Area.....Not Exceeding 1.5 mm² (.002 Sq. IN.)

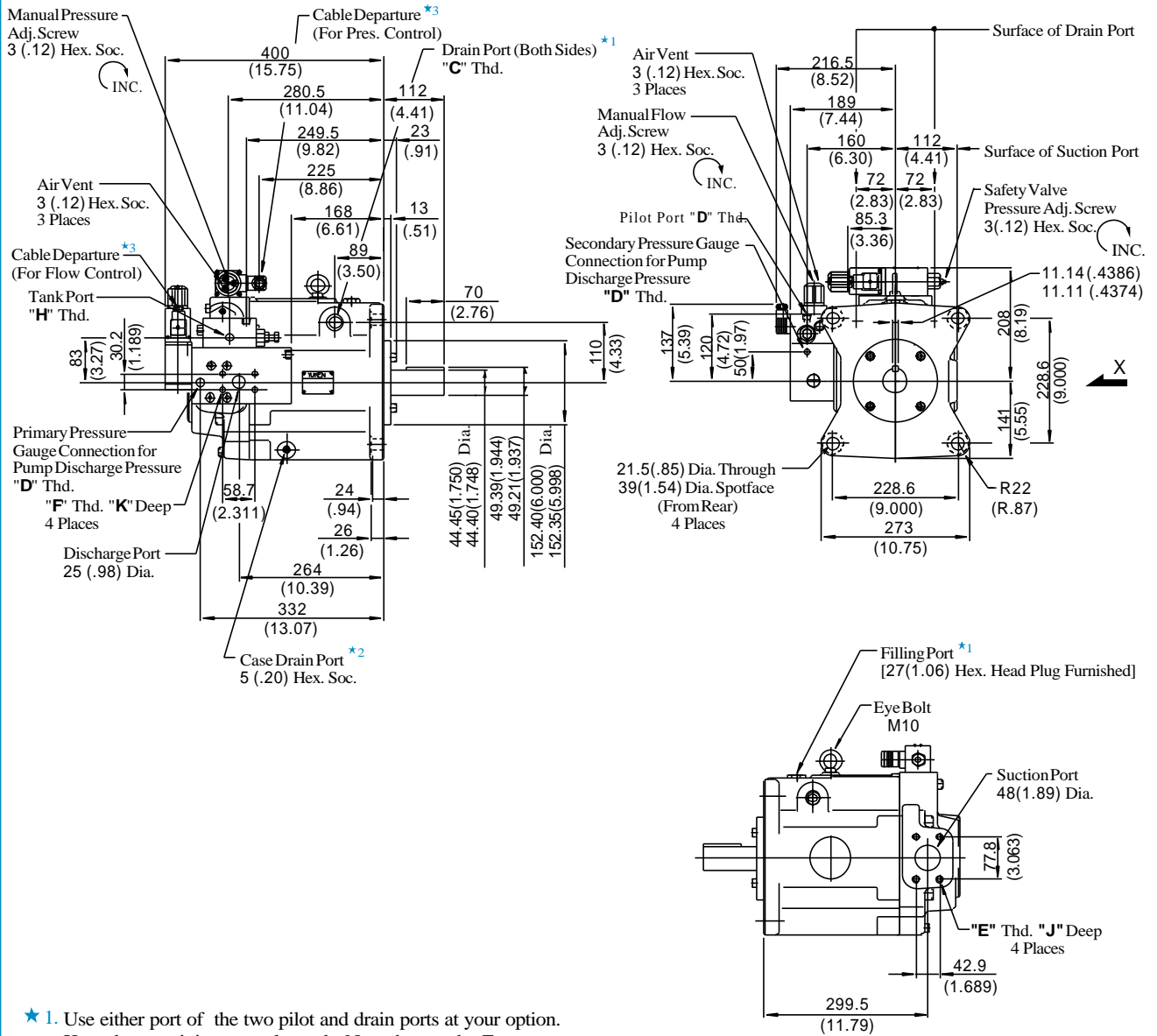
| Model Numbers | "C" Thd. | "D" Thd. | "E" Thd. | "F" Thd. | "H" Thd. | J mm (IN.) | K mm (IN.) |
|----------------|-----------|-------------|------------|-------------|-----------|------------|------------|
| A90-FR04* S-60 | Rc 3/4 | Rc 1/4 | M12 | M10 | Rc 3/8 | 19 (.75) | 17 (.67) |
| A90-FR04* S- | 3/4 BSP.F | 1/4 BSP. Tr | | | 3/8 BSP.F | | |
| 6080 | 3/4 NPT | 1/4 NPT | 1/2-13 UNC | 7/16-14 UNC | 3/8 NPT | 21 (.83) | 20 (.79) |

DIMENSIONS IN
MILLIMETRES (INCHES)

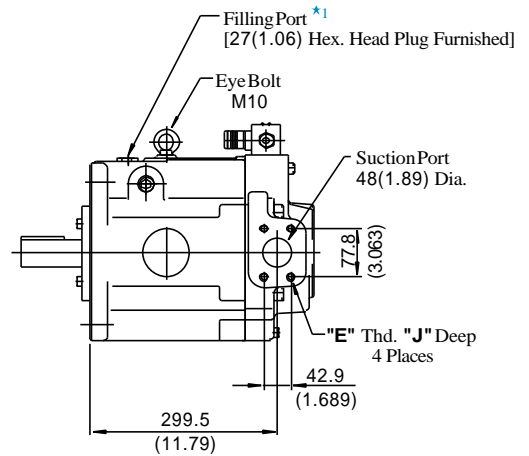
● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model.
Refer to page 22 for the dimensions of mounting bracket.

Flange Mtg. : A145-FR04*S-60/6080/6090



- ★ 1. Use either port of the two pilot and drain ports at your option. Keep the remaining port plugged. Note that on the European Design Standard (6080 Design), only the left side, as viewed from the shaft end, of the drain port is machined.
- ★ 2. Case drain ports are available for use when draining hydraulic fluid from pump casing.
- ★ 3. Cable Applicable:
Outside Dia.....8-10 mm (.31-.39 IN.)
Conductor Area.....Not Exceeding 1.5 mm² (.002 Sq. IN.)



View Arrow X

| Model Numbers | "C" Thd. | "D" Thd. | "E" Thd. | "F" Thd. | "H" Thd. | J mm (IN.) | K mm (IN.) |
|----------------|----------|-----------|------------|-------------|----------|------------|------------|
| A145-FR04*S-60 | Rc 3/4 | Rc 1/4 | M12 | M10 | Rc 3/8 | 19 (.75) | 17 (.67) |
| A145-FR04*S- | 3/4BSP.F | 1/4BSP.Tr | | | 3/8BSP.F | | |
| 6080 | 3/4 NPT | 1/4 NPT | 1/2-13 UNC | 7/16-14 UNC | 3/8 NPT | 21 (.83) | 20 (.79) |

DIMENSIONS IN
MILLIMETRES (INCHES)

● Foot Mounting Type

Mounting bracket is common to that of pressure compensator model. Refer to page 23 for the dimensions of mounting bracket.