

DENISON HYDRAULICS Variable Flow Control Valve

Series 2F1C



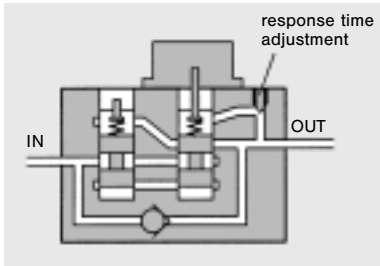
Publ. 5-EN 4050-A (dig.), replaces 5-EN 405-A

DENISON Hydraulics

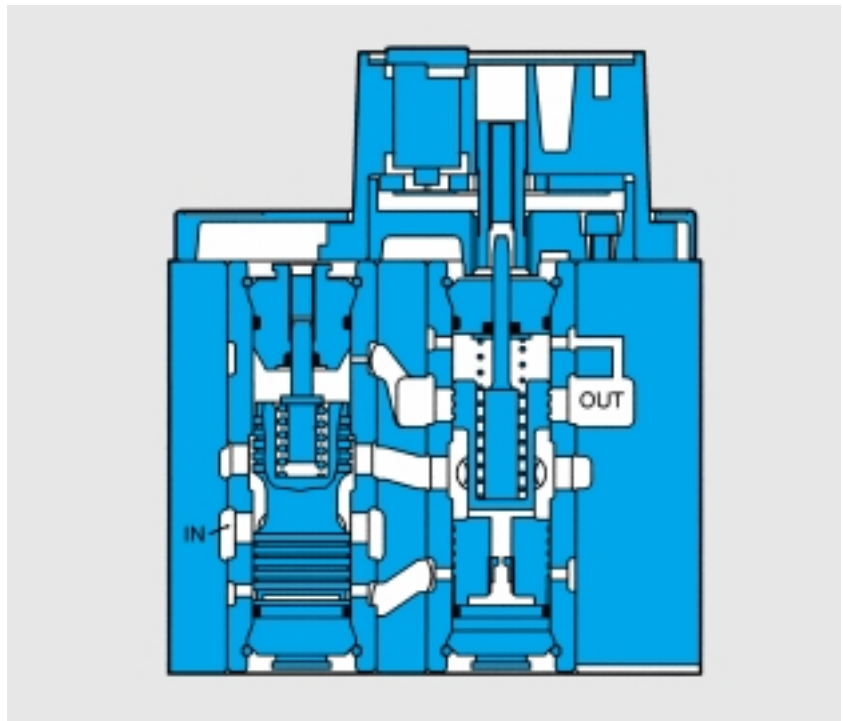
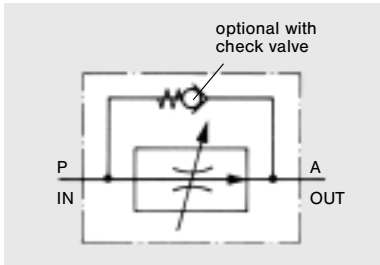
FEATURES

- Precise stepless adjustable flow control, without shock loading.
- Metering spool in neutral position closed – no flow peaks.
- Independent of pressure and viscosity changes (pressure compensated).
- Exceptionally precise control within the lower flow range can be obtained by the soft start characteristics:
 - first revolution ... 20% of max. flow
 - second revolution ... 80% of max. flow
- Adjustment device is lockable by key.
- The adjustment is precisely repeatable across the full flow range.
- Flow control valves, incorporating an integral check valve, allow fluid to by-pass the control mechanism and flow freely from outlet to inlet port (reverse flow page 6).
- The 2F1C flow control valve offers the option of an mechanically adjustable response time.
- World wide DENISON Service.

BASIC CIRCUIT DIAGRAM



SYMBOL



DESCRIPTION

DENISON flow control valves provide accurate speed control of cylinders and motors. The DENISON 2F1C flow valves are pressure compensated and viscosity independent. The valve in principal is a combination of two shifting spools, a compensator spool and a throttle spool. The throttle spool is manually operated and controlled by a valve control knob. The compensator spool automatically adjusts it's orifice to maintain a constant pressure difference across the throttle spool orifice.

DENISON 2F1C flow control valves have a key lock in the control knob which has three positions as follows:

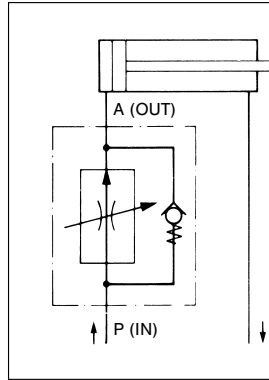
- Lock** Holds the setting position and does not permit unauthorised re-adjustment.
- Adjust** Permits full adjustment through an angle of 700°.
- Trim** Permits adjustment of approximately 10° and can be used for minor flow corrections.

Also it is possible to adjust the response time on the front plate. 2F1C flow control valves operate without shock loading, as the metering spool with the adjustable "fine throttle" is closed in a no-load condition. The required flow is adjusted by the control knob and can be repeated by observation on a built-in scale. An exceptionally precise control within the lower flow ranges can be obtained by the soft start characteristics.

With code "C" an integral reverse flow check valve is available which allows flow from outlet port to the inlet port.

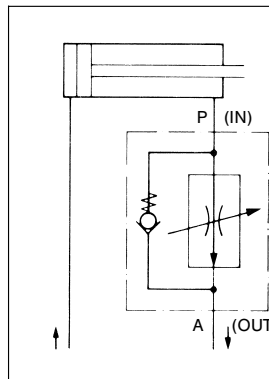
APPLICATION EXAMPLES

METER-IN SYSTEM



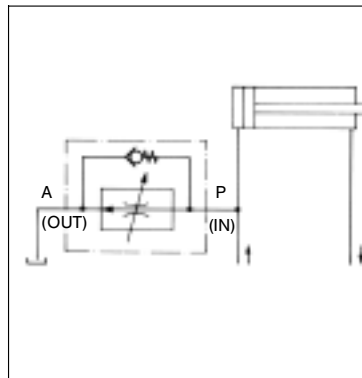
The system arrangement of flow control valves depends on individual requirements. If an actuator, e.g. cylinder or motor, is under load conditions acting against the system pressure a flow control valve can be applied as a meter-in system thus directing controlled flow to the actuator.

METER-OUT SYSTEM



On applications where a stiff hydraulic control is necessary due possibly to positive and negative loads on the actuator, a meter-out system similar to that indicated figure can be used. In this case the flow from the actuator is controlled by the flow control valve.

BY-PASS SYSTEM



If for particular reasons either of the above methods of control are not practical, e.g. flow rate in excess of valve capacity, a by-pass system may be applied as shown. This arrangement not only allows valves to control high capacity systems but also affords a power saving feature.

TECHNICAL DATA, ORDERING CODE

GENERAL

<ul style="list-style-type: none"> • Type of unit • Design • Type of mounting • Type of port connections • Port sizes (subplate) • Weight • Mounting position • Direction of flow • Ambient temperature range • Suitability for special working conditions 	2 Port Variable Flow Control Valve (pressure compensated) Sharp edge orifice Subplate mounted Thread in subplate 2F1C02 2F1C03 G 3/8" G 3/4" 6 kg 9 kg optional IN → OUT - 20 ... + 60 °C Consult DENISON
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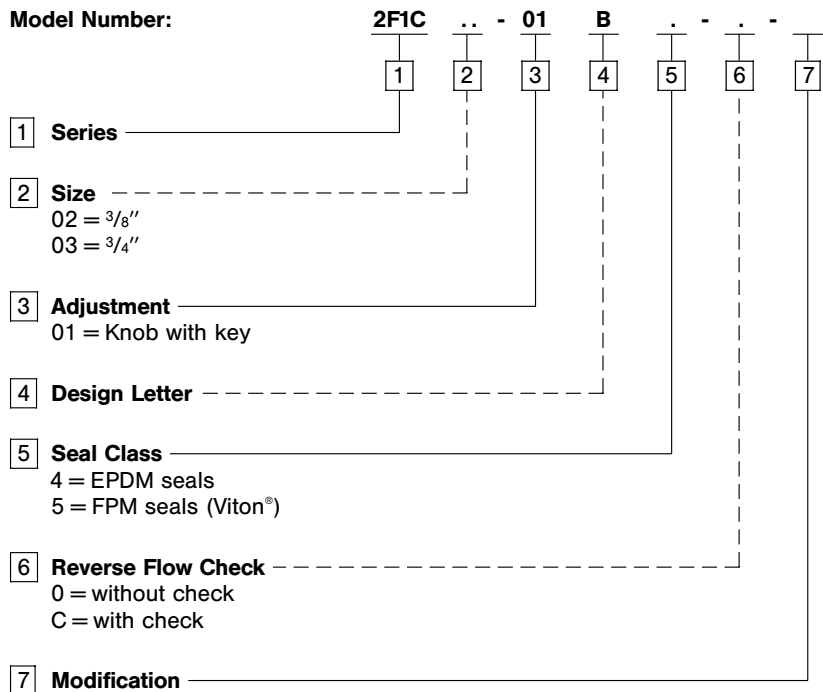
HYDRAULIC CHARACTERISTICS

<ul style="list-style-type: none"> • Operating pressure range - inlet (at max. flow) - outlet (at max. flow) • Fluid temperature range • Viscosity range • Recommended operating viscosity • Contamination level 	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"></td> <td style="width: 25%;">2F1C02</td> <td style="width: 25%;">2F1C03</td> </tr> <tr> <td>- inlet (at max. flow)</td> <td>14 ... 280 bar</td> <td>14 ... 350 bar</td> </tr> <tr> <td>- outlet (at max. flow)</td> <td>0 ... 270 bar</td> <td>0 ... 340 bar</td> </tr> </table> - 18 °C ... + 80 °C 10 ... 650 cSt 30 cSt Max. permissible contamination level according to NAS 1638 Class 8 (Class 9 for 15 Micron and smaller) or ISO 17/14		2F1C02	2F1C03	- inlet (at max. flow)	14 ... 280 bar	14 ... 350 bar	- outlet (at max. flow)	0 ... 270 bar	0 ... 340 bar
	2F1C02	2F1C03								
- inlet (at max. flow)	14 ... 280 bar	14 ... 350 bar								
- outlet (at max. flow)	0 ... 270 bar	0 ... 340 bar								

TYPE OF ADJUSTMENT

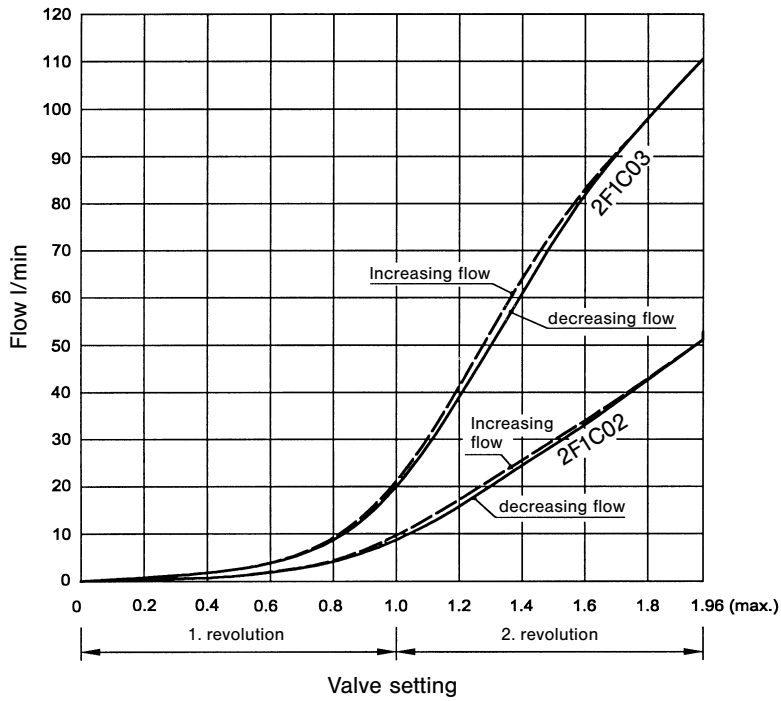
<ul style="list-style-type: none"> • Manual • Angular movement 	700 degree
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ORDERING CODE

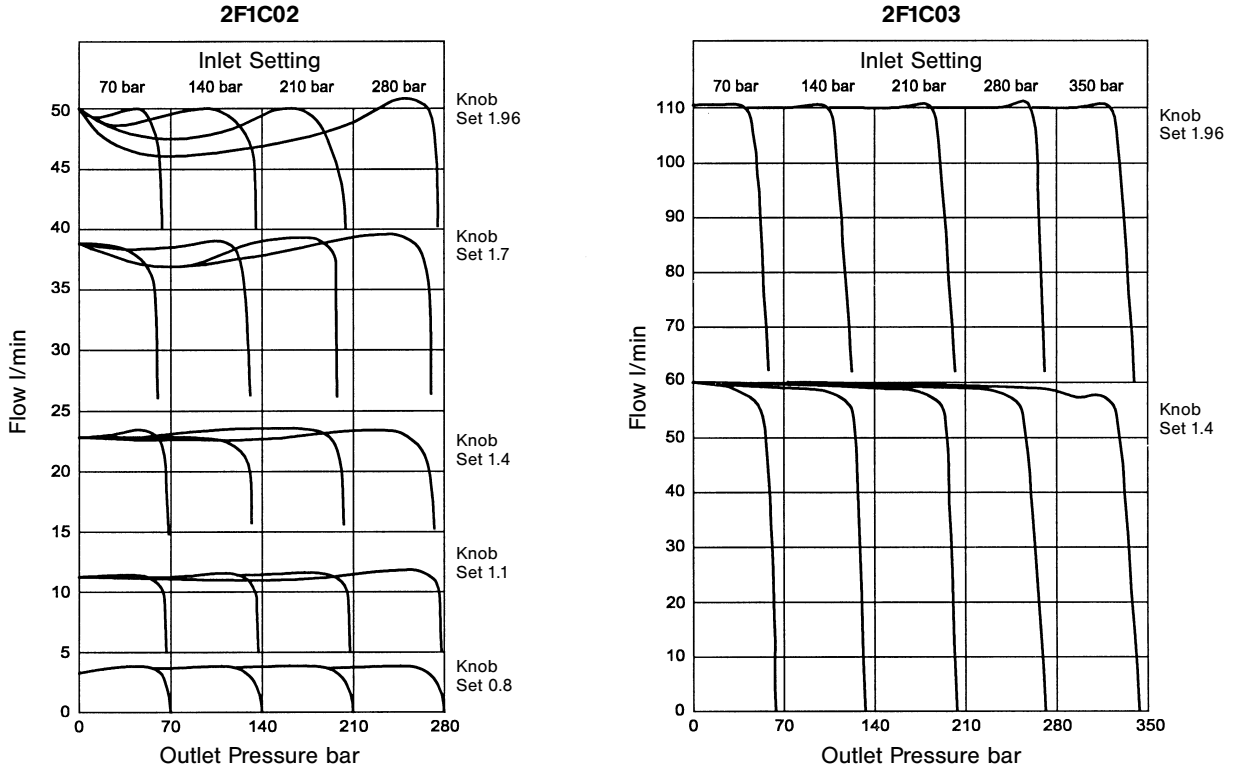


CURVES

Flow / Knob Adjustment Characteristics at 210 bar



Flow / Pressure Drop Characteristics
Constant Inlet Pressure – Variable Outlet Pressure



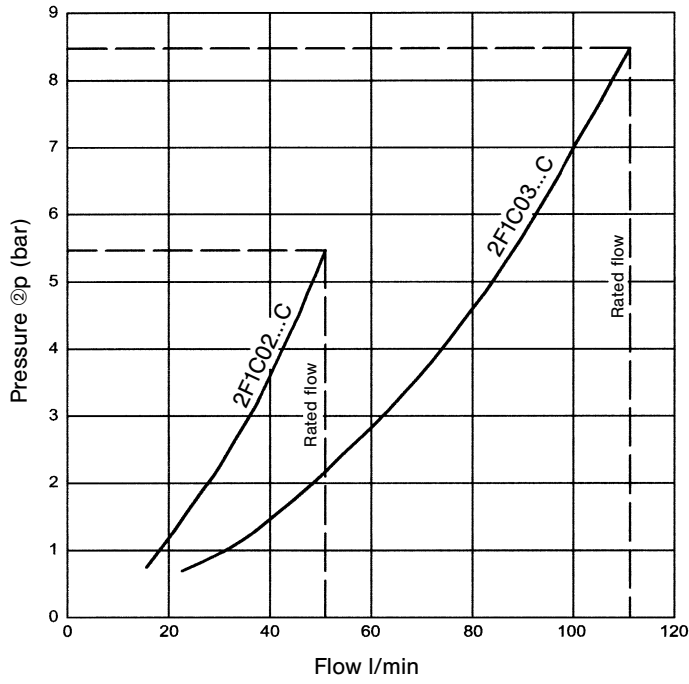
CURVES

Pressure Drop / Flow Characteristics

for reverse flow direction

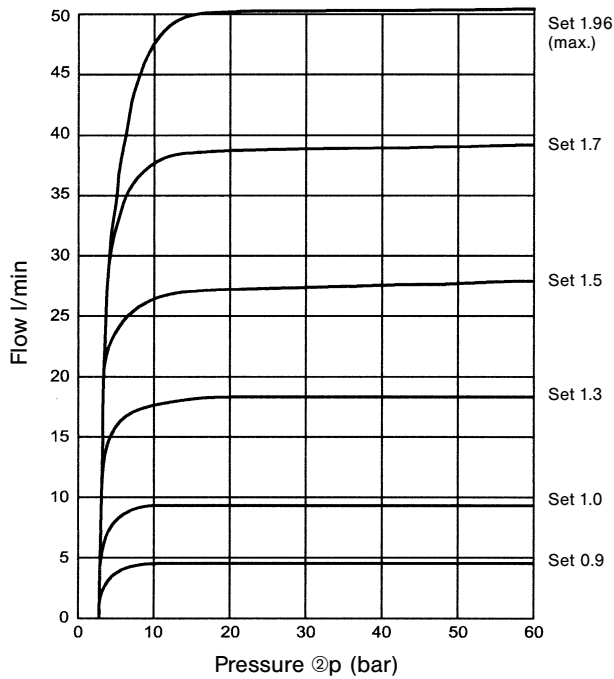
2F1C02 at 280 bar

2F1C03 at 350 bar

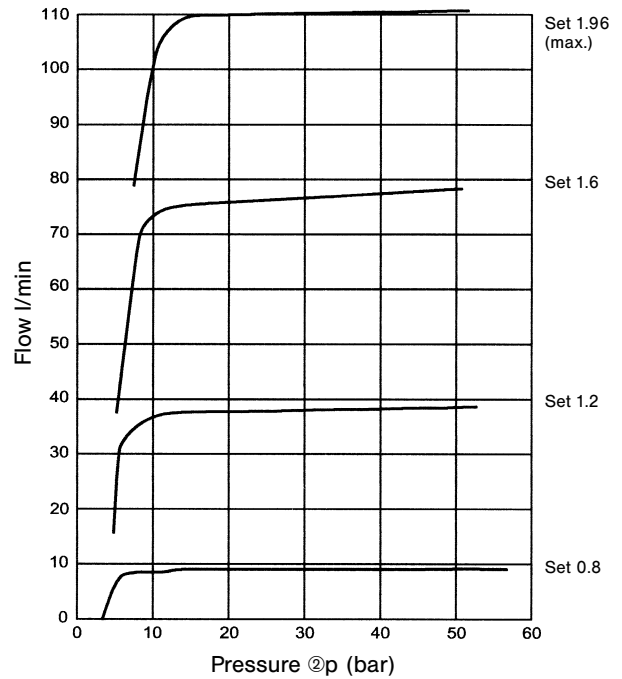


Flow / Minimum Operating Pressure Characteristics

2F1C02

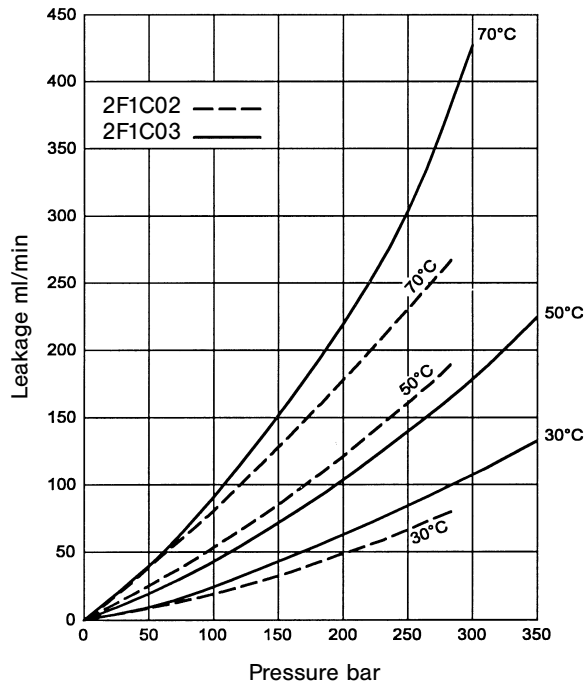


2F1C03



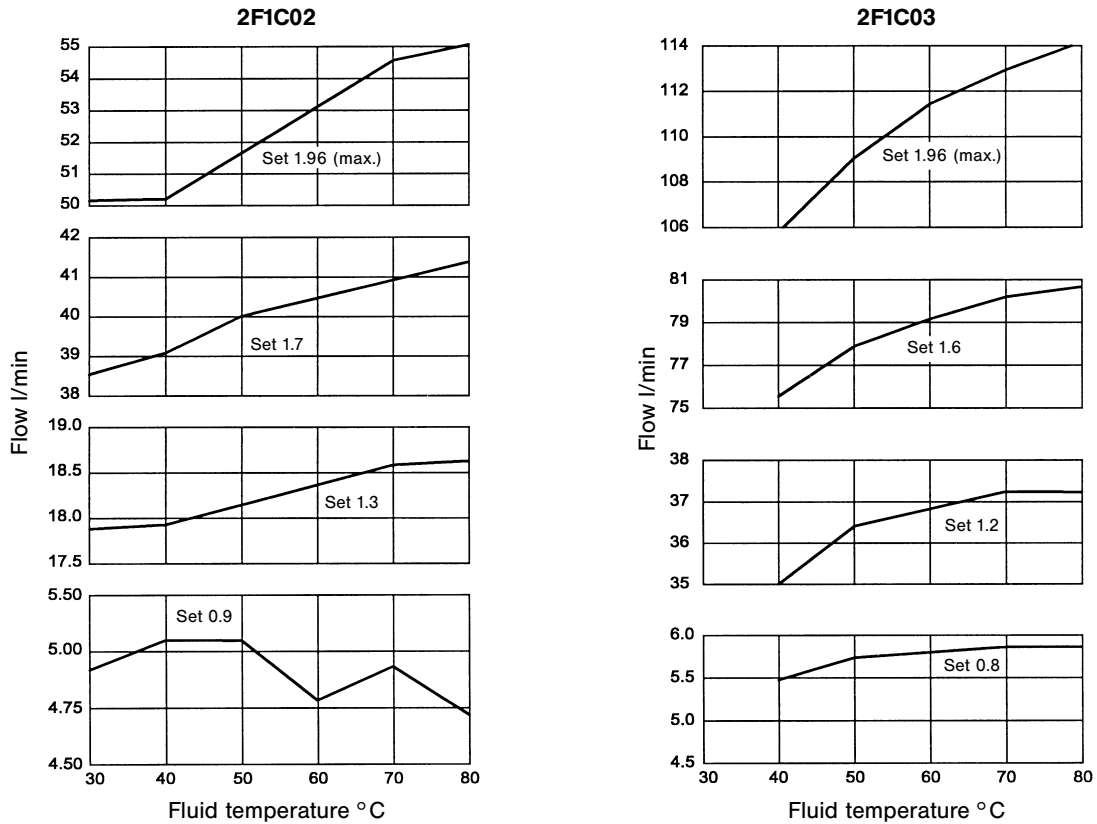
CURVES

Leakage / Pressure Characteristics



Flow / Temperature Range Characteristics

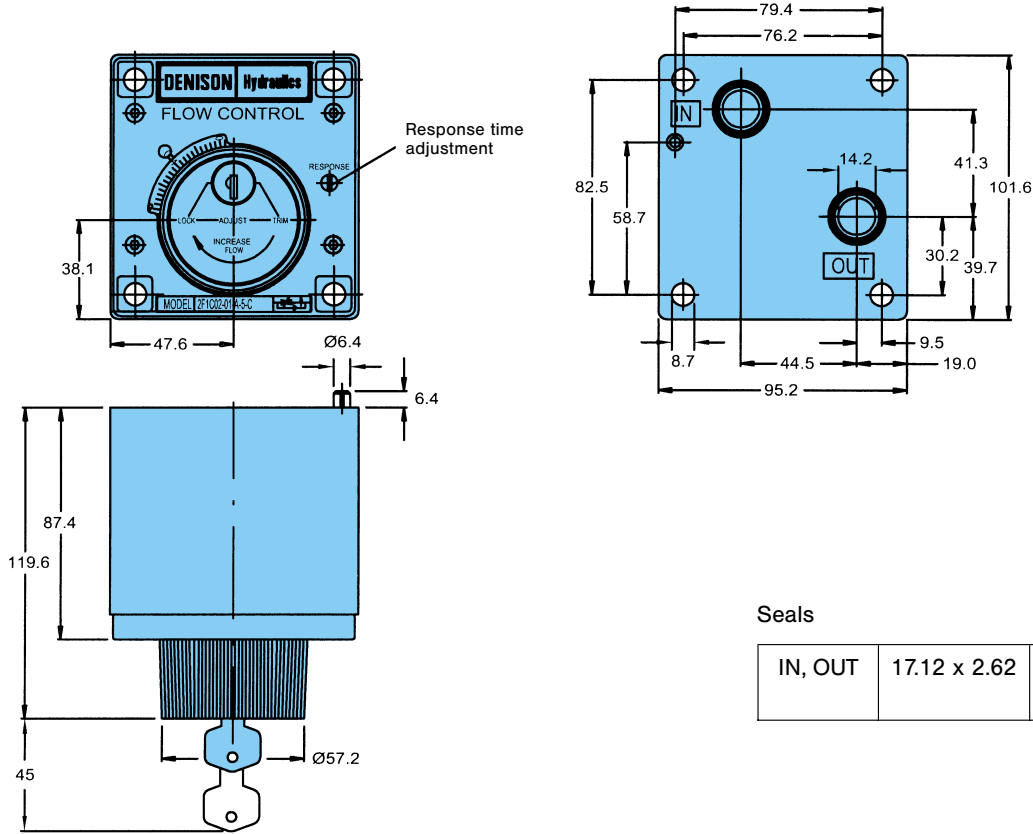
at 210 bar



All curves are typical and results of tests. Operating temperature = 50 °C, oil viscosity = 40 cSt.

DIMENSIONS

2F1C02



2F1C03

