

CRANE FLUID SYSTEMS

OUR GENIUS IS VALVES

Peak Pro™

PRESSURE INDEPENDENT CONTROL VALVE (PICV)

D995 DN40-50

GENERAL NOTES

The Crane Fluid Systems D995 PICV;

- can be used in variable volume heating and chilled water systems
- provides modulating control for terminal units when installed with a modulating actuator
- has an equal percentage control characteristic at all pre-set flow rates with actuator
- has built in Differential Pressure Control
- has an operating temperature: 0 to 90°C
- product available up to 800 kPa
- has a maximum operating pressure of 16 bar
- Integral test points for verification of ΔP and valve performance

**PICV D995 DN40-50**

LIMITS OF USE

These valves have been categorised in accordance with the Pressure Equipment Directive–PED.

The fluid to be transported is limited to group 2 liquids i.e. non-hazardous. On no account must these valves be used on any group 1 liquids, group 1 gases or group 2 gases.

INSTALLATION

These instructions are issued as guidelines only and do not cover all installed conditions. If unsure, please contact our Technical Helpline before installation.

- Crane FS products are designed for installation and use within suitably designed systems reflecting CIBSE, BSRIA and HVAC guidelines. Particular care should be taking with regards to;
 - accessibility to valve for setting/adjustment
 - tube cutting
 - jointing
 - bracketing/supports
- orientation: whilst the PICV can operate correctly in different orientations, there are recommendations regarding the orientation of actuators - Please refer to separate actuator IOM
- would normally be installed on return pipework, i.e. after the equipment it is controlling, but can be installed in flow if required.
- ensure direction of flow is correct - indicated by forged arrow on body.
- D995 operates between a minimum and maximum pressure drop across the valve - see commissioning.
- PICV's are not designed as isolation valves. Dedicated isolation valves should be installed to isolate against system pressure, i.e. for maintenance etc., when disconnecting/draining pipework.
- systems should be installed with strainers to protect the PICV and other installed items.

INSTALLATION (CONTINUED)

Please note this valve must not be used for end of line service or as an isolation valve. In order for the valve to function as intended water quality should be maintained at all times (e.g. as per BSRIA BG50 or equivalent).

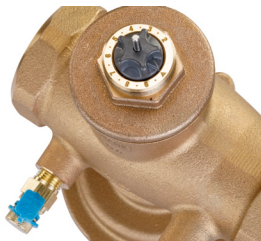
FLUSHING

Control valves, like the PICV, are sized to give good control over the system flow, therefore have been designed with small convoluted flow paths. Even when fully open these flow paths may not allow adequate water velocities for flushing of the coil. In line with BSRIA recommendations, it is recommended that a flushing point be located between the coil and the PICV. This allows the coil to be flushed without the water passing through the PICV. As per the Dominator Peak Pro range.

SET POSITION

The PICV set position can be established by **use of lookup table on page 4**

- Identify installed valve from marking on side of body
- Check flow rate required
- Read across chart:
 - Valve = DN40
 - Required flow rate = 2.33 l/sec
 - Set position = 8



To set the flow rate, using your hand, turn the dial to close the valve (position 0), then re-open the valve by turning the dial anti-clockwise until position 8 is reached. Please note at no point should any tools, such as spanners, be used to set the dial.

COMMISSIONING

The D995 controls the flow rate depending on its set position, therefore, removing the need to measure the flow rate.

The D995 maintains a constant differential pressure across its internal seat, any excess pressure being removed by the internal differential pressure controller. To ensure that sufficient pressure is available for the differential pressure controller to control the flow rate correctly, a differential pressure reading should be taken using the test points provided.

When taking differential pressure readings, it is important that the system is running at full load, i.e. at their set position. This ensures that differential pressure readings are carried out in the most unfavourable conditions, guaranteeing optimum performance in normal running conditions.

To ensure that all PICVs are working at the required differential pressure, it is necessary to check the least favoured / index PICV. By verifying the least favoured PICV is set to the required differential pressure, all other PICVs must have a higher differential pressure. However, we would also recommend that a selection of other PICVs are tested along the circuit to verify this.

The PICV is designed to be operated under dynamic conditions (i.e. variable pump loads). It is therefore good practice to exercise the valve if left in a static condition for an extended period (i.e. over 72 hours). The valve can be exercised via a linked actuator, using the valve cap, or manually turning the valve. This will aid in maintaining a steady flow rate within the operating range of the valve.

DN40 - DN50 PICV

The settings provided are for guidance only and will provide an accuracy in the region of +/- 15%. With the use of a flow measuring device this accuracy can be further improved in the region of +/-10%.

DIFFERENTIAL PRESSURE REQUIREMENTS

Each valve size, at each % setting option, requires a minimum ΔP (Differential Pressure) to ensure the PICV is within its working range.

POS	DN40		DN50	
	Typical Flow (l/s)	Typical ΔP	Typical Flow (l/s)	Typical ΔP
1	N/A	N/A	N/A	N/A
2	0.39	25	0.69	25
3	0.64	25	1.18	25
4	0.94	30	1.68	30
5	1.32	35	2.14	35
6	1.65	35	2.58	35
7	1.98	35	2.99	35
8	2.33	40	3.35	35
9	2.70	45	3.64	40
10	3.00	50	3.80	40

For flow rates in between settings, extrapolation of position can be used.

The pump speed should be set to ensure that the required differential pressure is always available. By setting the differential pressure across the least favoured PICV to the value stated in the above table, it ensures that minimum pump energy is used, therefore, reducing system running costs and CO₂ emissions.

To set pump speed to achieve this; whilst measuring ΔP , increase pump speed until ΔP is at, or just above, the minimum shown in the table above. Flow rate verification should be carried out using separate Flow Measurement Devices (FMD) where fitted. In line with CIBSE & BSRIA recommendations, we recommend that as a minimum requirement, FMDs are installed in all branches.

Where flow rate verification is required at terminals, FMDs may also be installed at each terminal. Terminal flow rates can also be confirmed by measuring branch flow rates and closing individual terminal PICVs one at a time and measuring the reduction in flow at the branch. Care should be taken to ensure that reduced flow rates are still within the measuring range of the branch FMD, i.e. that the measured 'signal' doesn't drop below 1kPa.

ACTUATOR OPTIONS

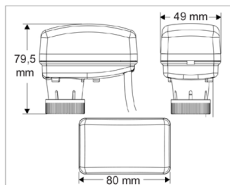
The D995 PICV is designed to work with ACT991M modulating actuators, ACT991TP three point actuators and ACT995FB Feedback actuators.

For Installation, operating and maintenance guidance on the ACT991TP (Three Point) please see separate IOM shipped with the actuator.

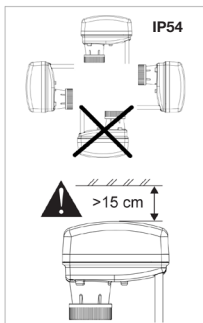
Crane cannot be held responsible for the control function if alternative actuators are used.

ACT991M (MODULATING) & ACT995FB (FEEDBACK) ACTUATORS

To fit the actuator, remove protective cap from the valve, and follow the installation instructions supplied with the actuator. The connecting thread on the valve and actuator is M30 x 1.5.



Overall Dimensions



Mounting Options

	MAX	50 °C 122 °F
	MIN	0 °C 32 °F
	MAX	90 RH%
	MIN	10 RH%
	MAX	95 °C 203 °F
	MIN	0 °C 32 °F

Temperature Limits

ACT991M (MODULATING) & ACT995FB (FEEDBACK) ACTUATORS

The LED at the front of the actuator signals actuator position:



LED



- OFF
- OFF
- AUS
- Spento
- Apagado
- UIT
- AV
- OFF
- Wyłączony
- Выкл.
- Desligado
- 关闭

Actuator operation indicator



- Green • Vert • Grün • Verde • Verde • Groen
- Grön • Zelený • Zielony • Зеленый • Verde • 绿色



- Moving to Position
- Aller en position
- Motor fährt zur Hubposition
- In movimento verso la posizione
- Posicionando
- Positioneren
- Går till Position
- Poťahy na pozici
- Ruch do pozycji
- Отслеживание
- Em movimento para a posição
- 正在运转



- Position reached
- Position atteinte
- Hubposition erreicht
- Posizione raggiunta
- Posición alcanzada
- Positie bereikt
- Position nådd
- pozice dosažena
- Pozycja osiągnięta
- Положение достигнуто
- Posição alcançada
- 运转到位



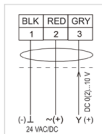
- Red • Rouges • Rot • Rosso • Rojo • Rood • Rött
- Červený • Czerwoný • Красный • Vermelho • 红色的



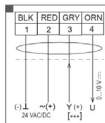
- Power on Calibration
- Calibration en cours
- Kalibrierungszyklus
- Calibrazione in corso
- Calibración al encendido
- Voeding aan en kalibreren
- Spänning på Kalibrering
- Prohřívá kalibrace
- Kalibrowanie
- Происходит калибровка
- Calibração na inicialização
- 正在校验



- 4-20mA / 2-10 VDC
- Failure signal loss
- Perte du signal d'erreur
- Eingangssignal nicht vorhanden
- Mancanza di segnale
- Fallo perdida de señal
- Foutmelding geen stuursignaal
- Styringsnaffel
- Porucha - ztráta fidičního signálu
- Brak sygnału
- Сбой - потеря сигнала
- Falha, perda de sinal
- 无信号源



ACT991M modulating wire diagram



Feedback wire diagram ACT995FB

CONNECTING TO VALVE

Before fitting to valve:

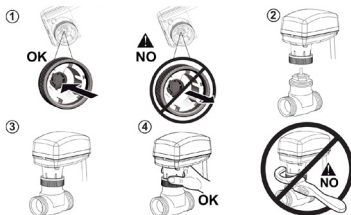
Ensure that spindle is fully retracted (1)

Carefully align actuator and valve connection threads (2)

Turn actuator connection nut clockwise to secure to valve (3)



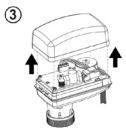
Hand tighten only (4)

Do not over-tighten.

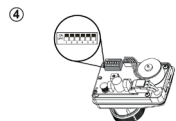
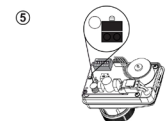


ACTUATOR SETTING UP

Customer only needs to remove lid if changing settings from default below.

- ① 
 - ② 
 - ③ 
1. Ensure that power supply is disconnected
 2. Gently loosen actuator cover from main body
 3. Remove cover, and keep in safe place

ELECTRO-MECHANICAL ACTUATOR: ACT991M

- ④ 
- ⑤ 

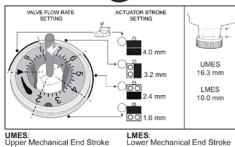
24VAC/DC,
50/60Hz, 2.5VA

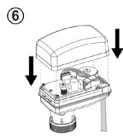


140N Min. - 8s/mm
- IP43

0-10V Input Signal

*Default setting

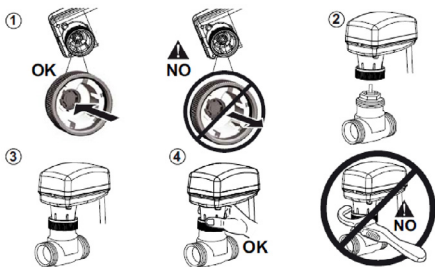
1	<input type="checkbox"/> NO	<input type="checkbox"/> 0...10VDC	<input type="checkbox"/> 0...10VDC
2	<input type="checkbox"/> 0...20mA	<input type="checkbox"/> 0...20mA	<input type="checkbox"/> 2...10VDC
3	<input type="checkbox"/> DA	<input type="checkbox"/> RA	<input type="checkbox"/> 2...10VDC
4	<input type="checkbox"/> LIN	<input type="checkbox"/> Eq%	<input type="checkbox"/> 4...20mA
5	<input type="checkbox"/> VDC	<input type="checkbox"/> mA	
6			
1: CONTROL SIGNAL		4: ACTION	
2: RANGE		5: CURVE	
3: SIGNAL TYPE		6: SIGNAL TYPE	



- ⑥ 
 - ⑦ 
 - ⑧ 
6. Align to top cover
 7. Refit to cover securely
 8. Power supply can now be connected.

FITTING THE ACTUATOR

The valve and actuator have matching threads. The actuator comes supplied with an adaptor ring, so no additional one is required. Simply screw the adaptor ring onto the valve and fit the thermal head onto it. Rotate the lower ring until you hear two clicks.



The rotation of the lower ring of the actuator onto the valve sets the valve to its normally closed position.



To visit our Video Library go to:
www.youtube.com/user/CraneBSU

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- Designed and manufactured under quality management systems in accordance with BS EN ISO 9001.

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