AMOT CONTROLS

Quality and reliability for over 50 years

3-Way Temperature Control Valves

Electric or Pneumatic Control Valve Systems

APPLICATION

The complete temperature control valve system. Systems can be configured to suit applications from pneumatics to PLC control with communications. Amot control valve systems are recognised as becoming the industry standard.

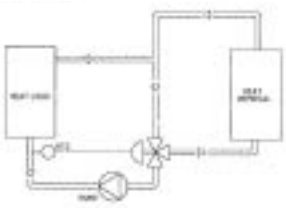
- *More accurate*
- *Powerful*
- *Flexible*
- *Lightweight*
- *Fast*
- *Small*

Western Way, Bury St Edmunds, Suffolk IP33 3SZ, UK Telephone: +44 (0)1284 762222 Fax: +44 (0)1284 760256

FLEXIBLE APPLICATION

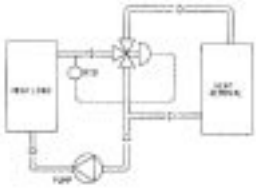
Lubricating Oil Temperature Control

Lubrication oil temperature control is normally configured in a mixing application controlling the return temperature to the heat load. The temperature is normally measured as close as possible to the sump return.



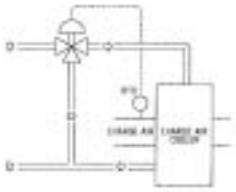
Jacket Water Cooling

Jacket water cooling in diverting applications regulates the outlet coolant water temperature from a diesel or gas engine. The valve either sends water to a cooler or bypass loop, accurately maintaining the temperature. The temperature is normally measured at the outlet from the heat source.



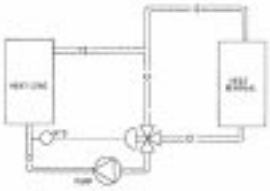
Charge Air Temperature Control

The intercooler is used to cool high temperature turbo charger air. In this application the G Valve regulates the flow of cooling water through an intercooler, which can increase efficiency, enhance performance and help meet today's environmental requirements.



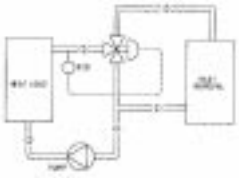
Central Cooling

For large flow central cooling, mixing or diverting applications where accurate temperature control is required. The capabilities of the G Valve provide the ideal solution.



Sea Water Cooling

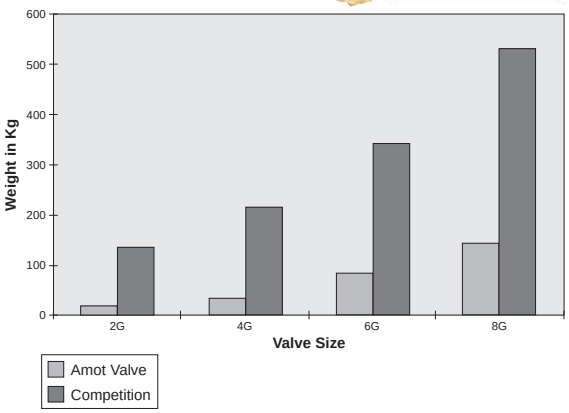
On sea water cooling applications, Bronze G valves are recommended. These can be used for mixing and diverting applications.



LIGHT WEIGHT AND COMPACT

Compact, yet robust, the Amot G Valve is the ideal choice. The Valve is lighter and more compact than most other valves used in this application.

G Valve compared to typical equivalent competitors specification



SELECT THE RIGHT VALVE

The G valve is only part of the complete Amot Controls valve range. Amot also offer a range of internally sensed valves, with the well proven Amot wax pill technology, and a range of globe type valves that are ideal for steam, process and general industrial applications.

To help make the selection of the ideal valve quickly and easily, Amot also offer a G Valve selector – supplied on two free disks.

Full technical selection data, documentation and CAD drawings available in most formats.

FEATURES

- Any direction of rotation
- Any rotor-port configuration (most models)
- Most compact construction available
- Low pressure drop
- High accuracy (± 1˚C or Better)
- Mount in any position
- Manual override
- Temperature up to 100˚C (212˚F), higher temperature versions available
- Local valve position indication
- Fail-safe spring return on pneumatic valves
- Rated to DIN ND6, ND10, ND16, ANSI 125lb, ANSI 150lb, JIS 10k and JIS 5k

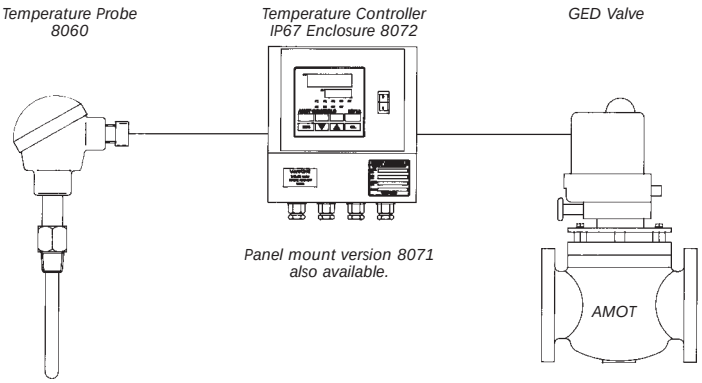
G VALVE SYSTEM SOLUTIONS

The System is available in 3 standard control configurations, offering flexibility for most requirements.

ELECTRIC SYSTEM

Refer to Page 4

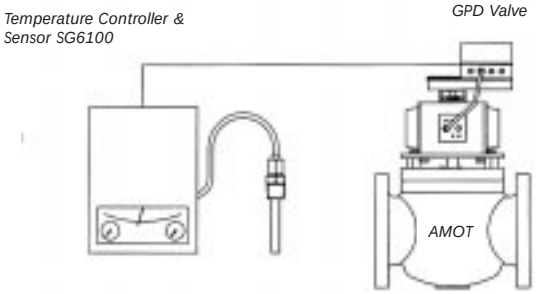
The electric valve system incorporates the use of an electrically actuated three-way control valve with an electronic controller. The controller can be either panel, or wall mounted. The system is completed with a temperature sensor. The electric G Valve system is simple to install with standard three core cable, and provides more accurate measurement and control than typical pneumatically operated systems through the utilisation of a precision electronic controller.



PNEUMATIC SYSTEM

Refer to Page 9

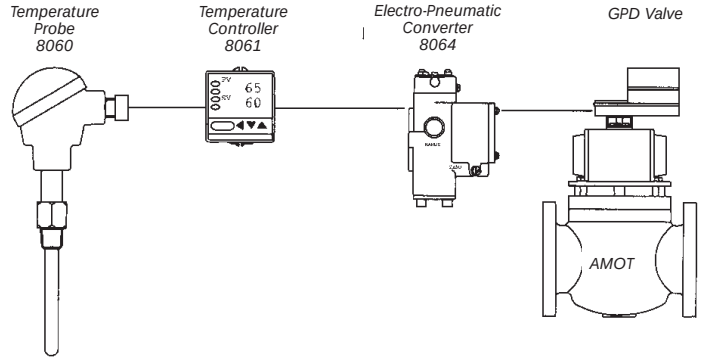
The pneumatic valve system incorporates a pneumatically actuated three-way control valve with controller and integral temperature sensor which can be panel or wall mounted. The pneumatic G Valve system is ideal when there is a lack of electricity, when a fail-safe system is needed,or in a hazardous area installation.



ELECTRO-PNEUMATIC SYSTEM

Refer to Page 12

The electro-pneumatic valve system combines both electric and pneumatic technology, consisting of a pneumatically actuated three-way control valve with an electro pneumatic converter. The probe sends a resistance signal to the electronic controller, which in turn sends a 4 to 20mA signal to an I/P converter that converts this to a pneumatic signal. The electro-pneumatic system combines the features and functionality of the Amot electronic control system with the fail-safe action and hazardous area mounting benefits of a pneumatically actuated valve.

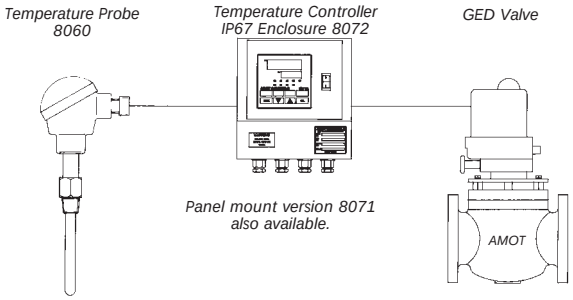


Electric G Valve System

ACCURATE TEMPERATURE CONTROL

- *Amot G valves are ideal for the control of fluid temperature by 'diverting' or 'mixing' techniques in process control and other industrial applications.*
- *The valves can be used for fresh and sea water, most lubricating oils and other liquids.*
- *The compact construction gives unobstructed full-bore flow, hence pressure losses are minimal.*

Typical system:



VALVE BODY

Flow to: *2000m³/hr (8800 us gpm)*
Sizes: *50mm (2") to 400mm (16")*
Body materials:

Cast iron: *(BS:1452 250)*	*For fresh water, lubricating oils*
Bronze: *(BS:1400 LG2)*	*For seawater, shock resistance, or magnetic permeability*
Steel: *(BS:3100 A1)*	*For high strength and high pressure ratings*
Ductile Iron: *(BS:2789 SNG 420/12)*	*High performance iron*
Stainless Steel: *(BS:3100 316C16F)*	*Corrosive and special applications*
Rotor material:	*Bronze or Stainless Steel*
Rotor Shaft:	*Stainless Steel*
Shaft Seal Material:	*Nitrile or Viton rubber*
Flanges:	*Most DIN, ANSI and JIS standards*
Maximum Internal Valve Pressure:	*Cast iron, ductile iron or bronze 10 bar (145 psi) Steel and stainless steel: 16 bar (232 psi)*
Maximum Temperature of fluid:	*100˚C (212˚F) Refer to factory for higher temperature requirements*
Vibration:	*Meets Lloyd's vibration test 2. (±1.6mm Displacement @ 2 to 25 Hz 4G @ 25 to 100 Hz)*

DIMENSIONS

Refer to page 17.

ELECTRIC ACTUATOR

A rugged quarter turn actuator powered by an electric motor driving a worm type gearbox. Fitted with manual override as standard, enabling valve operation without power. A thermal cutout is installed to prevent excessive overheating. Limit switches at each end of stroke disconnect motor power when end of stroke is reached. These can also be used for remote indication.

Housing:	*Cast aluminium base, steel cover and two part Polyurethane paint finish. Weatherproof to IP65. M20 Conduit Thread.*
Power Supply:	*110/120V or 220/240V AC single phase, 50/60 Hz.*

Actuator for	*2G, 3G, 4G*	*6G, 8G, 10G*	*12G, 14G, 16G*
Motor input power	*72 Watts (220V) 100 Watts (120V)*	*200 Watts (220V) 270 Watts (120V)*	*200 Watts (220V) 270 Watts (120V)*
Running Current	*0.4 Amp (220V) 1.1 Amp (120V)*	*1.1 Amp (220V) 2.1 Amp (120V)*	*1.1 Amp (220V) 2.1 Amp (120V)*
Starting Current	*0.5 Amp (220V) 1.6 Amp (120V)*	*1.7 Amp (220V) 2.9 Amp (120V)*	*1.7 Amp (220V) 2.9 Amp (120V)*
Output Torque Break	*310 lb.in. (35 Nm)*	*1328 lb.in. (150 Nm)*	*4425 lb.in. (500 Nm)*
Stroke Time	*6 Seconds*	*9 Seconds*	*20 Seconds*

G VALVE SIZE SELECTION

The valve selection graph shown opposite is intended for use with water only, for other fluids use the sizing calculations shown on page 20.

For stable control the valve should be selected to provide a pressure drop with full flow of between 0.01 and 0.1 bar (0.1 and 1.4 psi).

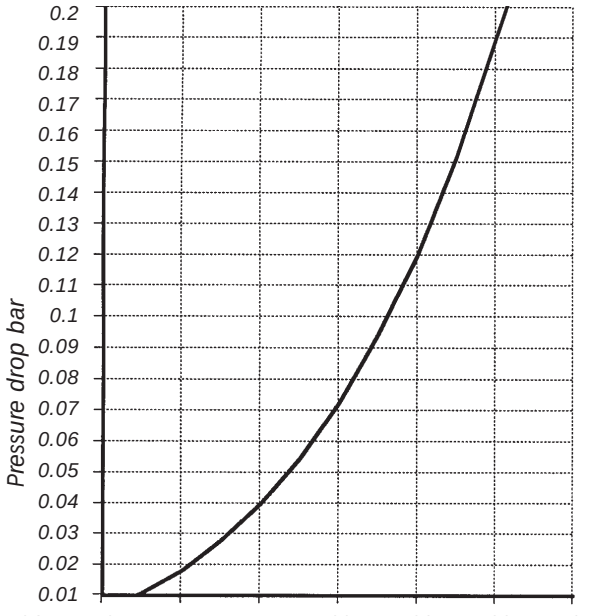
To use the graph it is recommended to use the following method.

1. *Start with a pressure drop of 0.05 bar on the vertical axis, read across to the curve.*
2. *Follow this line down to the flow rates below until you find the value closest to your flow rate.*
3. *Follow the line across to the left to determine suitable valve size.*

For valve dimensions refer to page 17.

For further information such as bypass leakage rates refer to page 20.

For flow and pressure other than those shown refer to page 23 for conversions.



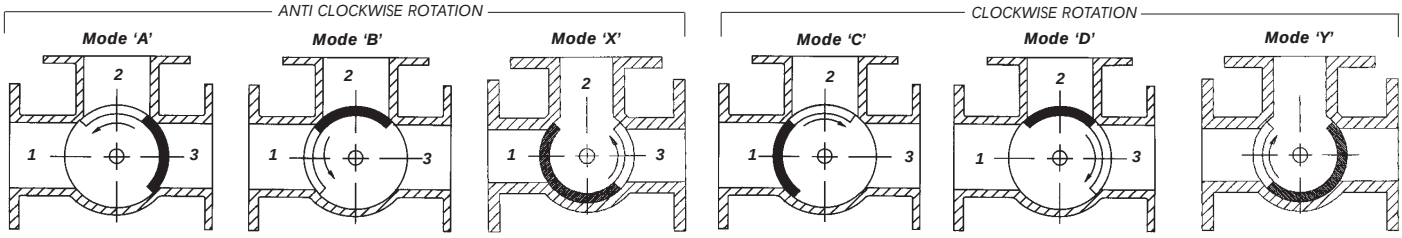
2G	6	11	17	22	28	33	35
3G	12	25	37	50	62	75	80
4G	22	44	67	89	111	133	140
6G	50	100	150	200	250	300	320
8G	90	180	265	355	445	530	565
10G	140	300	415	555	695	830	830
12G	200	400	600	800	1000	1200	1270
14G	270	545	815	1090	1360	1630	1730
16G	355	710	1065	1420	1780	1832	1885

Flowrate m^3/hr

MODES OF OPERATION

The unique construction of the Amot G valve provides total flexibility by allowing you to select the valve port positions most ideally suited to meet your application requirements. There are two main types of mode of operation:

1. *90 degree rotor that allows either ports 1 or 3 to be selected as the common port.*
2. *180 degree rotor that requires port 2 to be the common port.*



NOTE: Modes X and Y not available for models 10G, 12G, 14G & 16G

VALVE CODING SYSTEM

2 GED B B Ø F A – AA

SIZE		
2	50mm	(2")
3	80mm	(3")
4	100mm	(4")
6	150mm	(6")
8	200mm	(8")
10	250mm	(10")
12	300mm	(12")
14	350mm	(14")
16	400mm	(16")

BODY/SEAL MATERIAL	
B	Bronze & Nitrile
C	Cast Iron & Nitrile
D	Ductile Iron & Nitrile
S	Cast Steel & Nitrile
R	Stainless Steel & Nitrile
E	Bronze & Viton
F	Cast Iron & Viton
G	Ductile Iron & Viton
H	Cast Steel & Viton
J	Stainless Steel & Viton

FLANGE DRILLING		
A	ND6 (AMOT Metric No 1)	
B	ND10 (AMOT Metric No 2)	
C	ND16 (AMOT Metric No 3)	
F	ANSI 125LB	
J	ANSI 150LB	} (Steel Only)
H	ANSI 300LB	
L	JIS 10K	
M	JIS 5K	

VALVE OPERATION	
VALVE ACTION WITH RISING TEMPERATURE	ACTUATOR CODE
Anti-clockwise Port 3 to Port 2	A
Anti-clockwise Port 2 to Port 1	B
Clockwise Port 1 to Port 2	C
Clockwise Port 2 to Port 3	D
Anti-clockwise Port 1 to Port 3	X
Clockwise Port 3 to Port 1	Y

ELECTRIC ACTUATOR					
	CONDUIT THREAD				
ACTUATOR TYPE	M20	PG 11	PG 13.5	PG 16	1/2 NPT
220V	A	B	C	D	E
220V with Potentiometer	F	G	H	J	K
110V	L	M	N	P	R
110V with Potentiometer	S	T	V	W	X

Note: *Stainless Steel and Steel versions not available on models 10G, 12G, 14G & 16G.*

8071 and 8072 Electric PID Valve Controller

The 8071 is a compact rugged PID controller for use with the Amot electrically actuated model GE control valve. Designed for ease of installation, simple operation and reliability.

The controller is available in 2 options. The 8071 panel mount controller and the 8072 which comprises of the 8071 in a pre wired IP67 splash-proof enclosure for wall mounting.

FEATURES

- *Fully programmable "Fuzzy logic" PID or ON/OFF control with adjustable hysteresis.*
- *Offers remote operation.*
- *2 Temperature setpoints*
- *A 4-digit, easy-to-read, dual LED display showing set points and process values.*
- *"Brilliant™" PID control for accurate control*
- *Optional alarms may be specified as a deviation or process alarm.*
- *A wide range of thermocouple, RTD, current and voltage inputs available.*
- *Available in panel or wall mount systems*
- *Loop alarm may be configured to detect a break in the sensor circuit.*
- *Automatic or manual valve operation.*

8071 Panel Mount version

8072 Wall Mount version

DIMENSIONS

Refer to Page 18.

TECHNICAL SPECIFICATIONS FOR ELECTRIC VALVE CONTROLLER

Standard Input	:	*RTD PT100 (3-Wire)*
Sensing Range	:	*0 to 120˚C (32˚ to 250˚F)*
Supply Voltage	:	*100 to 240 VAC, 50/60 Hz*
Power Consumption	:	*Less than 12 VA*
Ambient Temperature	:	*0 to 50˚C (32˚ to 122˚F)*
Ambient Humidity	:	*20 to 80% RH*
Magnetic Field	:	*Less than 400 AT/m*
Relays	:	*8071 and 8072A – Integral 3 amp relays 8072B – Additional internal 12 amp relays*
Net Weight	:	*8071 0.3 Kg (0.7lb) 8072 1.7 Kg (3.7lb)*
Sampling Time	:	*0.5 Seconds*
Setting Accuracy	:	*Better than ±0.5%*
Control Action	:	*Proportional, Integral and Derivative with Fuzzy Logic*
Control Functions:		
Proportional Band	:	*0.1˚ to 120˚C (32° to 250˚F)*
Integral Action	:	*1 to 3600 Seconds*
Derivative Action	:	*0 to 3600 Seconds*
Set Data Lock	:	*Standard*

PID CONTROLLER

The valve controller features a 4-digit, dual display, with 2 temperature setpoints and optional alarms as standard. The unit is a powerful 3 term controller with 'Brilliant™' PID control action and comes in a 1/4 DIN (96mm x 96mm) panel mounting enclosure. Easy to configure for a range of inputs and outputs. The standard input is a 3-wire PT100 RTD. Using the third wire, the controller automatically compensates for RTD cable length.

FUZZY LOGIC 'BRILLIANT™' PID CONTROL ACTION

The controller uses fuzzy logic, a constantly changing mathematical function that continually adjusts its integral action so that the proportional band is equally displaced around the setpoint, with minimal over and under shoot of the system.

RELAY MODULE 8073A

This module is specially designed for extended reliability in more arduous applications sometimes encountered when using the AMOT G valve.

The unit contains two 12 amp heavy duty relays configured in such a way that it is impossible for both relays to be energised at the same time.

Suppressors are fitted across the contacts to reduce arcing. The 8073A relay module weighs 0.39kg (0.8 lbs) and is 125 x 125 x 75mm (5 x 5 x 3 inches) when installed as a stand alone unit. Installed integral in 8072B.

CONTROLLER CODING

Panel mount 8071 specify model code:

8071A013 - AA

Wall mount 8072B with weatherproof box and heavy duty relays (12 amp):

8072B0132 - AA *(240 volt)*

8072B0131 - AA *(110 volt)*

Wall mount 8072A with weatherproof box and standard relays (3 amp):

8072A0132 - AA

Amot Controls recommends that 12 amp relays be used for maximum performance. To order the relays as a separate module within a weatherproof box specify:

8073A2 *(240 volt)*

8073A1 *(110 volt)*

ADDITIONAL INFORMATION

Refer to page 18 for dimensions.
Refer to pages 21 and 22 for technical information on controller setup and functions.
Refer to page 23 for wiring diagrams.

8060
3-wire PT100 Temperature Sensor

- *Temperature sensor for the Amot Electronic Valve Controller and other PT100 applications.*
- *Platinum 3 wire RTDs, with stainless steel Thermal Well and IP54 aluminium connection head.*
- *Recommended temperature sensor for Amot Model G Control Valve System.*
- *–100 to 350˚C (–150 to 600˚F) temperature sensing range.*
- *Can use standard 3-core cable.*

OPTIMUM PERFORMANCE

Any temperature control system requires accurate measurement for optimum performance:

- *Ensure probe is immersed in centre of flow.*
- *Ensure probe is installed a minimum of 6 x pipe diameter from a junction or flow disturbance.*
- *Always use heat transfer compound in thermal well.*
- *Always install as close as possible to position where temperature control is required.*

MODEL CODE

MODEL 8060A *1* *2 – AA*

CONDUIT CONNECTION	
CODE	CONNECTION
1	M20
2	PG 13.5
3	PG 16
4	1/2 NPT

INSTALLATION THREAD	
CODE	CONNECTION
2	1/2 BSP (TR)
3	1/2 NPT

DIMENSIONS

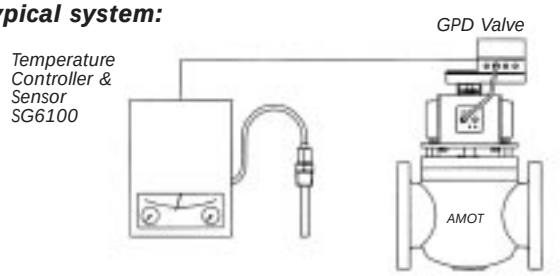
Refer to Page 18.

Pneumatic G Valve System

ACCURATE TEMPERATURE CONTROL

- *Amot G valves are ideal for the control of fluid temperature by 'diverting' or 'mixing' techniques in process control and other industrial applications.*
- *The valves can be used for fresh and sea water, most lubricating oils and other liquids.*
- *The compact construction gives unobstructed full-bore flow, hence pressure losses are minimal.*

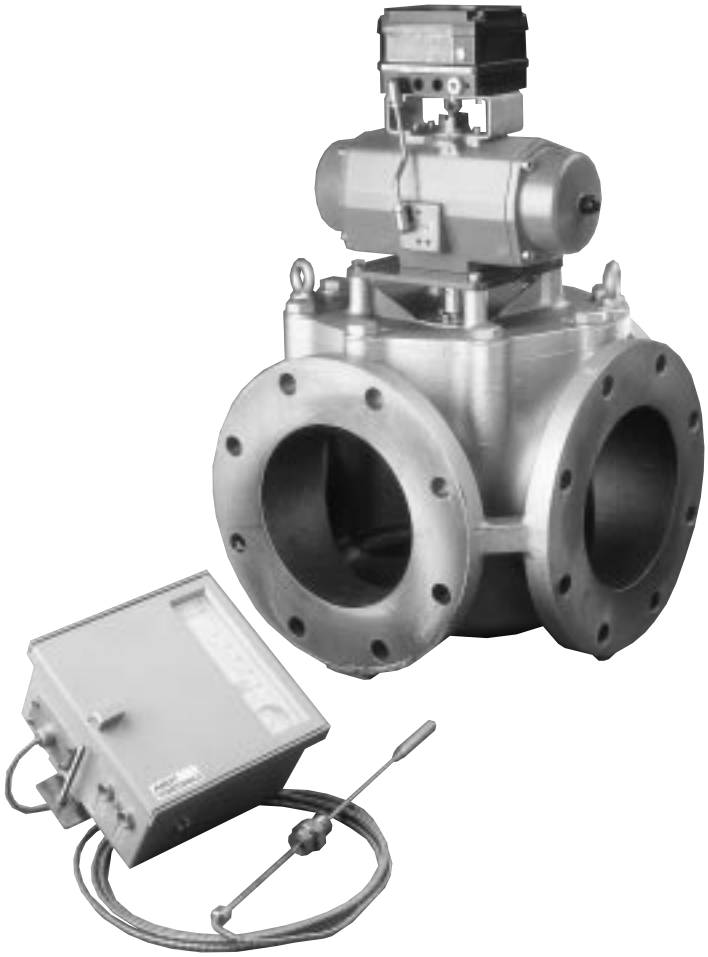
Typical system:



VALVE BODY

Flow to: *2000m³/hr (8800 us gpm)*
Sizes: *50mm (2") to 400mm (16")*
Body materials:

Cast iron: *(BS:1452 250)*	*For fresh water, lubricating oils*
Bronze: *(BS:1400 LG2)*	*For seawater, shock resistance, or magnetic permeability*
Steel: *(BS:3100 A1)*	*For high strength and high pressure ratings*
Ductile Iron: *(BS:2789 SNG 420/12)*	*High performance iron*
Stainless Steel: *(BS:3100 316C16F)*	*Corrosive and special applications*
Rotor material:	*Bronze or Stainless Steel*
Rotor Shaft:	*Stainless Steel*
Shaft Seal Material:	*Nitrile or Viton rubber*
Flanges:	*Most DIN, ANSI and JIS standards*
Maximum Internal Valve Pressure:	*Cast iron, ductile iron or bronze 10 bar (145 psi) Steel and stainless steel: 16 bar (232 psi)*
Maximum Temperature of fluid:	*100°C (212°F) Refer to factory for higher temperature requirements*
Vibration:	*Meets Lloyd's vibration test 2. (±1.6mm Displacement @ 2 to 25 Hz 4G @ 25 to 100 Hz)*



PNEUMATIC ACTUATOR

A rugged quarter turn, double piston, rack and pinion pneumatic actuator with spring return and valve positioner as standard. Actuators can be configured failsafe.

Housing:	*Cast aluminium base, steel cover and two part Polyurethane paint finish.*
	Weatherproof to IP65
	M20 Conduit Thread.
Supply Pressure:	*6 to 8 bar (90 to 115 psi)*
Signal Pressure:	*0.21 to 1.03 bar (3 to 15 psi)*
Pressure Connections:	*1/8" BSP PL*

DIMENSIONS

Refer to Page 17.

SG6100
PNEUMATIC CONTROLLER AND INDICATOR FOR TEMPERATURE OR PRESSURE

- *Complete Stand Alone Controller.*
- *Panel or wall mounted.*
- *Stainless steel temperature probe and capillary.*
- *7 precision pressure ranges.*
- *Compact and lightweight.*
- *Measures temperature or pressure indicated by a pointer on a graduated scale while the measured variable is regulated by a pneumatic control unit, sending a signal to the control valve actuator.*

TECHNICAL SPECIFICATIONS

AMBIENT TEMPERATURE LIMITS:
Service: –20 to +70°C (21 to 158°F)
Storage: –30 to +80°C (3 to 176°F)

HOUSING:
Dimensions: 192 x 192mm (7.6 x 7.6 in) DIN 43700
Protection grade: IP 55 – IEC 144
Material: Reinforced Polymer

CONTROL UNIT (Motion Balance System):
Proportional only: P = 2 to 200%
Proportional & Integral: P = 4 to 400%
I = 0.1 to 25 minutes.
Direct/Reverse acting: Reversible internally.

AIR SUPPLY:
1.4 ±0.1 bar (20 ±1.4 psi).

OUTPUT SIGNAL:
from 5 to 95% of supply pressure.

SET POINT:
Adjustable over full scale range.

OUTPUT INDICATOR SCALE:
0 to 2 bar (0 to 30 PSI)
Accuracy: +/– 2%

TEMPERATURE SENSOR:
AISI 316 stainless steel Mercury filled.
1/2" NPT connection
Adjustable immersion to 350mm (14 in.)
3m (9ft) AISI 316 stainless steel armoured capillary
Overtemperature – refer to model coding.

PRESSURE:
Connection 1/4" NPT

MOUNTING:
Panel or wall.

DIMENSIONS:
Refer to page 18.

MODEL CODE

SG6100 1 2 0

CONTROL ACTION	
1	Proportional
2	Proportional & Integral

OPTIONS	
0	Standard unit
1	Capillary 6m
2	IP65 housing
3	IP65 with 6m Capillary

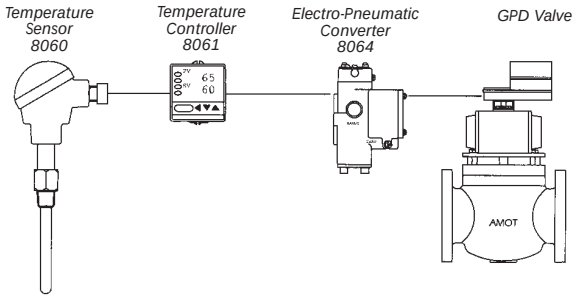
	SCALE RANGE		
	Vacuum		
1	–1 to 0 bar (–14.5 to 0 psi)		
	Pressure		
2	0 to 2.5 bar (0 to 36 psi)		
3	0 to 4 bar (0 to 58 psi)		
4	0 to 6 bar (0 to 87 psi)		
5	0 to 10 bar (0 to 145 psi)		
6	0 to 16 bar (0 to 232 psi)		
7	0 to 25 bar (0 to 363 psi)		
8	0 to 40 bar (0 to 580 psi)		
	Receiver		
B	0.2 to 1 bar (2.9 to 14.5 psi), 0–100 linear		
C	0.2 to 1 bar (2.9 to 14.5 psi), 0–10 square root		
	Temperature	***Over Temperature***	
H	–20 to +40°C (–4 to 104°F)	70°C (158°F)	Standard capillary length 3m
K	0 to +60°C (32 to 140°F)	70°C (158°F)	
L	0 to +100°C (32 to 212°F)	140°C (284°F)	
M	0 to +160°C (32 to 320°F)	240°C (464°F)	
N	0 to +250°C (32 to 482°F)	320°C (608°F)	

Electro-Pneumatic G Valve System

ACCURATE TEMPERATURE CONTROL

- *Amot G valves are ideal for the control of fluid temperature by 'diverting' or 'mixing' techniques in process control and other industrial applications.*
- *The valves can be used for fresh and sea water, most lubricating oils and other liquids.*
- *The compact construction gives unobstructed full-bore flow, hence pressure losses are minimal.*

Typical system:



VALVE BODY

Flow to: *2000m³/hr (8800 us gpm)*
Sizes: *50mm (2") to 400mm (16")*
Body materials:

Cast iron:	*For fresh water, lubricating oils*
(BS:1452 250)	
Bronze:	*For seawater, shock resistance, or*
(BS:1400 LG2)	*magnetic permeability*
Steel:	*For high strength and high pressure*
(BS:3100 A1)	*ratings*
Ductile Iron:	*High performance iron*
(BS:2789 SNG 420/12)	
Stainless Steel:	*Corrosive and special applications*
(BS:3100 316C16F)	
Rotor material:	*Bronze or Stainless Steel*
Rotor Shaft:	*Stainless Steel*
Shaft Seal Material:	*Nitrile or Viton rubber*
Flanges:	*Most DIN, ANSI and JIS standards*
Maximum Internal Valve Pressure:	
	Cast iron, ductile iron or bronze
	10 bar (145 psi)
	Steel and stainless steel:
	16 bar (232 psi)
Maximum Temperature of fluid:	
	100˚C (212˚F)
	Refer to factory for higher
	temperature requirements
Vibration:	*Meets Lloyd's vibration test 2.*
	(±1.6mm Displacement @ 2 to 25 Hz
	4G @ 25 to 100 Hz)

PNEUMATIC ACTUATOR

A rugged quarter turn, double piston, rack and pinion pneumatic actuator with spring return and valve positioner as standard. Actuators can be configured failsafe.

Housing:	*Cast aluminium base, steel cover and two part Polyurethane paint finish.*
	Weatherproof to IP65
	M20 Conduit Thread.
Supply Pressure:	*6 to 8 bar (90 to 115 psi)*
Signal Pressure:	*0.21 to 1.03 bar (3 to 15 psi)*
Pressure Connections:	*1/8" BSP PL*

DIMENSIONS

Refer to page 17.

G VALVE SIZE SELECTION

The valve selection graph shown opposite is intended for use with water only, for other fluids use the sizing calculations shown on page 20.

For stable control the valve should be selected so as to provide a pressure drop with full flow of between 0.01 and 0.1 bar (0.1 and 1.4 psi).

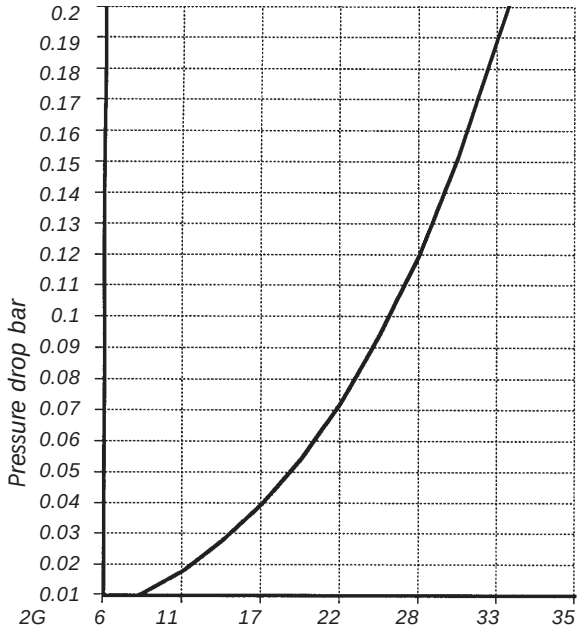
To use the graph it is recommended to use the following method.

1. *Start with a pressure drop of 0.05 bar on the vertical axis, read across to the curve.*
2. *Follow this line down to the flow rates below until you find the value closest to your flow rate.*
3. *Follow the line across to the left to determine suitable valve size.*

For valve dimensions refer to page 17.

For further information such as bypass leakage rates refer to page 20.

For flow and pressure other than those shown refer to page 23 for conversions.



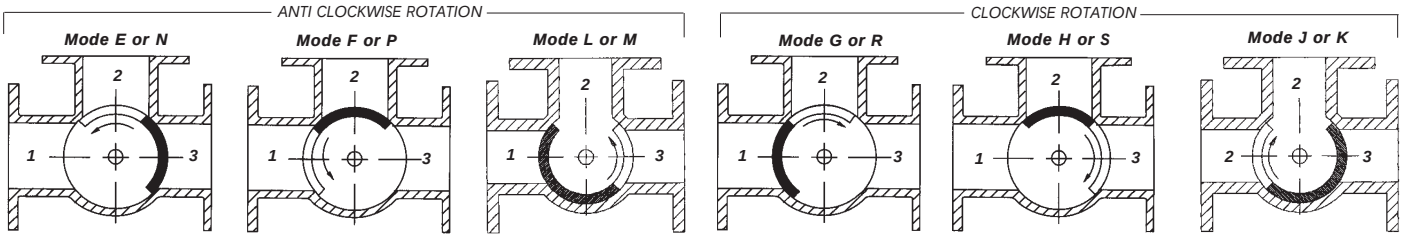
2G	6	11	17	22	28	33	35
3G	12	25	37	50	62	75	80
4G	22	44	67	89	111	133	140
6G	50	100	150	200	250	300	320
8G	90	180	265	355	445	530	565
10G	140	300	415	555	695	830	830
12G	200	400	600	800	1000	1200	1270
14G	270	545	815	1090	1360	1630	1730
16G	355	710	1065	1420	1780	1832	1885

Flowrate m^3/hr

MODES OF OPERATION

The unique construction of the Amot G valve provides total flexibility by allowing you to select the valve port positions most ideally suited to meet your application requirements. There are two main types of mode of operation:

1. *90 degree rotor that allows either ports 1 or 3 to be selected as the common port.*
2. *180 degree rotor that requires port 2 to be the common port.*



NOTE: Modes L, M, J and K not available for models 10G, 12G, 14G & 16G

VALVE CODING SYSTEM

2 GPD B B B Ø E – AA

SIZE		
2	50mm	(2")
3	80mm	(3")
4	100mm	(4")
6	150mm	(6")
8	200mm	(8")
10	250mm	(10")
12	300mm	(12")
14	350mm	(14")
16	400mm	(16")

BODY/SEAL MATERIAL	
B	Bronze & Nitrile
C	Cast Iron & Nitrile
D	Ductile Iron & Nitrile
S	Cast Steel & Nitrile
R	Stainless Steel & Nitrile
E	Bronze & Viton
F	Cast Iron & Viton
G	Ductile Iron & Viton
H	Cast Steel & Viton
J	Stainless Steel & Viton

FLANGE DRILLING		
A	ND6 (AMOT Metric No 1)	
B	ND10 (AMOT Metric No 2)	
C	ND16 (AMOT Metric No 3)	
F	ANSI 125LB	
J	ANSI 150LB	} (Steel Only)
H	ANSI 300LB	
L	JIS 10K	
M	JIS 5K	

VALVE OPERATION		
VALVE ACTION WITH RISING TEMPERATURE	REQUIRED CONTROL SYSTEM ACTION	
Anti-clockwise Port 3 to Port 2	DIRECT	E
	REVERSE	N
Anti-clockwise Port 2 to Port 1	DIRECT	F
	REVERSE	P
Clockwise Port 1 to Port 2	DIRECT	G
	REVERSE	R
Clockwise Port 2 to Port 3	DIRECT	H
	REVERSE	S
Anti-clockwise Port 1 to Port 3	DIRECT	L
	REVERSE	M
Clockwise Port 3 to Port 1	DIRECT	J
	REVERSE	K

PNEUMATIC ACTUATOR		
ACTUATOR TYPE	ACTUATOR PORT THREADING	
	BSP	NPT
0.21-1.03 BAR (3 to 15 PSI) Command Signal	B	F
0.21-1.03 BAR (3 to 15 PSI) Command Signal with Manual Override	C	G
Pneumatic 4 to 20mA Command Signal with Manual Override	D	H
Pneumatic 4 to 20mA Command Signal	E	J

Note: *Stainless Steel and Steel versions not available on models 10G, 12G, 14G & 16G.*

8064 Electro/Pneumatic Converter

- *Converts a 4 to 20 mA input signal to a directly proportional 0.2 to 1 bar (3 to 15 Psi) pneumatic output signal.*
- *Controls Amot Pneumatic G Valves, using an electric input signal from the 8061 PID temperature controller.*
- *High signal sensitivity.*
- *Rugged construction.*
- *Simplicity of design and operation*
- *Weatherproof to IP65.*
- *Shock and vibration resistant.*
- *Insensitive to supply pressure variations.*
- *Can be mounted with the valve or controller.*

SPECIFICATION

Supply Pressure	1.3 ± 0.1 bar (20 psi ± 2 psi)
Input	4 to 20 mA
Output	0.2 to 1 bar (3 to 15 psi)
Zero Offset Adjustment	+40% and –20% of span
Output Capacity	0.16 SCFM
Response Level	0.025% of span
Reproducibility	0.2% of span
Calibration accuracy	± 0.25% of span
Supply Pressure Effect	Less than 1% of span
Ambient Temperature Limits	–40˚C to +82˚C (–40˚F to 180˚F)
Coil Resistance	185 ohms
Body Material	Cast Iron
Top Housing & Terminal Cover	Aluminium
Paint Finish	Epoxy Powder
Weight	4.5kg (10.5 lbs)
Mounting	Vertical wall or 50mm (2”) pipe bracket
Approval	Cenelec EExia

MODEL CODE

8064A 7716-AA

DIMENSIONS

Refer to Page 18.

8061
PID Temperature Controller

- *Powerful 3 term self tuning 1/16 DIN Temperature and Process controller.*
- *Standard 3-Wire PT100 RTD input with 3rd wire cable run compensation.*
- *4-Digit, easy-to-read, dual LED display showing set point and process values.*
- *Fully programmable PID or ON/OFF control with adjustable hysteresis.*
- *Self tuning feature to simplify set up and assure optimum performance.*
- *Optional alarms may be configured to act as deviation or process alarm.*
- *Loop break alarm may be configured to detect a break in the sensor circuit.*
- *Configurable for a wide range of thermocouple, RTD, current and voltage inputs.*

SPECIFICATION

Supply Voltage	*85 to 264 VAC 50/60 Hz 17VA*
Standard Input	*RTD (PT 100) 3-Wire*
Output	*4 to 20 mA (load resistance less than 600 OHMS)*
Range	*0˚ to 120˚C (32˚ to 248˚F)*
Ambient Temperature	*0˚ to 50˚C (32˚ to 122˚F)*
Ambient Humidity	*45 to 85%*
Sampling Time	*0.5 Seconds*
Setting Accuracy	*Better than ±0.5%*
Control Action	*Proportional, Integral and Derivative with auto tune*
Control Functions	
Proportional Band	*0.1˚ to 120˚C (32° to 248°F)*
Integral Action	*0 to 3600 seconds*
Derivative Action	*0 to 3600 seconds*
Anti-Reset Wind Up	*1 to 100% of Proportional Band*
Cycle Time	*1 to 100 Seconds*
Set Data Lock	*Standard*
Power Failure	*Non Volatile memory*
Net Weight	*0.170 Kg (0.37 lbs)*

CE

DIMENSIONS

Refer to Page 18.

MODEL CODE

8061AD018NN1-AA

8060
3-wire PT100 Temperature Sensor

- *Temperature sensor for the Amot Electronic Valve Controller and other PT100 applications.*
- *Platinum 3 wire RTDs, with stainless steel Thermal Well and IP54 aluminium connection head.*
- *Recommended temperature sensor for Amot Model G Control Valve System.*
- *–100 to 350˚C (–150 to 600˚F) temperature sensing range.*
- *Can use standard 3-core cable.*

OPTIMUM PERFORMANCE

Any temperature control system requires accurate measurement for optimum performance:

- *Ensure probe is immersed in centre of flow.*
- *Ensure probe is installed a minimum of 6 x pipe diameter from a junction or flow disturbance.*
- *Always use heat transfer compound in thermal well.*
- *Always install as close as possible to position where temperature control is required.*

MODEL CODE

MODEL 8060A *1* *2 – AA*

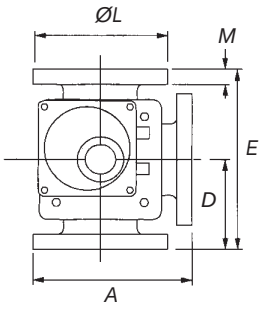
CONDUIT CONNECTION	
CODE	CONNECTION
1	M20
2	PG 13.5
3	PG 16
4	1/2 NPT

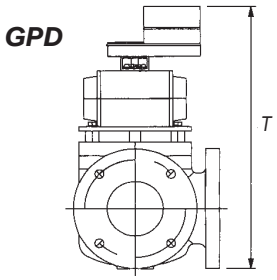
INSTALLATION THREAD	
CODE	CONNECTION
2	1/2 BSP (TR)
3	1/2 NPT

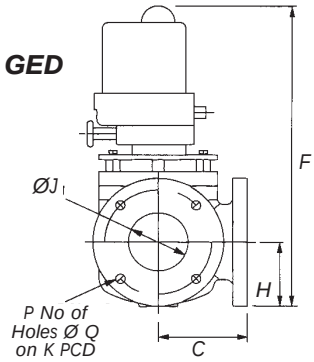
DIMENSIONS

Refer to Page 18.

VALVE DIMENSIONS







VALVE SIZE NOMINAL BORE MM (inches)

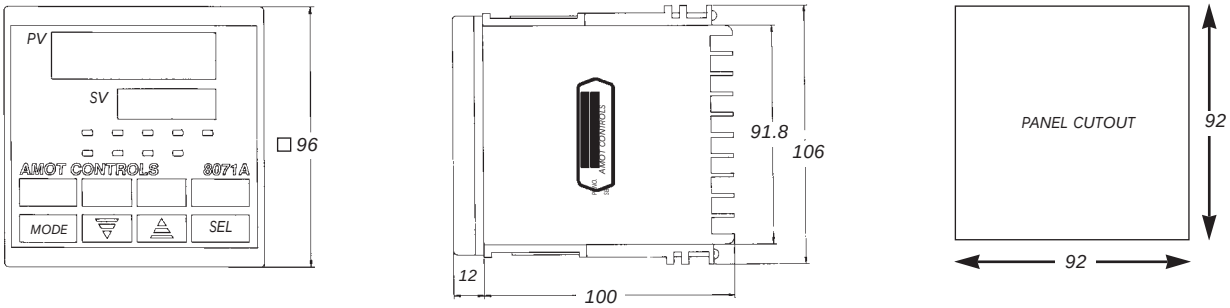
Dimension		2G	3G	4G	6G	8G	10G	12G	14G	16G
A		197.5 (7.776)	240 (9.449)	260 (10.236)	327 (12.874)	395 (15.551)	469 (18.465)	574 (22.598)	624 (24.567)	706 (27.795)
C		115 (4.528)	140 (5.512)	150 (5.906)	185 (7.284)	225 (8.858)	260 (10.236)	300 (11.811)	340 (13.386)	385 (15.158)
D		115 (4.528)	140 (5.512)	150 (5.906)	185 (7.284)	225 (8.858)	260 (10.236)	300 (11.811)	340 (13.386)	385 (15.158)
E		230 (9.055)	280 (11.024)	300 (11.811)	370 (14.567)	450 (17.717)	520 (20.472)	600 (23.622)	680 (26.772)	770 (30.315)
F		425 (16.732)	460 (18.110)	580 (22.834)	637 (25.078)	708 (27.874)	885 (34.843)	1075 (42.323)	1150 (45.275)	1230 (48.425)
H		82.5 (3.248)	100 (3.937)	126 (4.961)	142 (5.590)	170 (6.692)	252 (9.921)	297 (11.693)	339 (13.347)	378 (14.882)
ØJ		50 (1.969)	80 (3.150)	100 (3.937)	150 (5.906)	200 (7.874)	250 (9.843)	300 (11.811)	350 (13.780)	400 (15.748)
K	ND 6	110 (4.3)	150 (5.9)	170 (6.7)	225 (8.8)	280 (11)	335 (13)	395 (15.5)	445 (17.5)	495 (19.4)
	ND 10	125 (4.912)	160 (6.299)	180 (7.087)	240 (9.449)	295 (11.614)	350 (13.714)	400 (15.748)	460 (18.110)	515 (20.276)
	ND 16	125 (4.921)	160 (6.299)	180 (7.087)	240 (9.449)	295 (11.614)	355 (13.967)	410 (16.142)	470 (18.504)	525 (20.670)
	ASA 125 lb	120.6 (4.748)	152.4 (6.000)	190.5 (7.500)	241.3 (9.500)	298.5 (11.750)	361.95 (14.250)	431.8 (17.00)	467.3 (18.750)	539.75 (21.250)
	JIS 5K	—	—	165 (6.5)	230 (9)	280 (11)	—	390 (15.3)	—	—
	JIS 10K	—	—	175 (6.9)	240 (9.4)	290 (11.4)	—	—	—	—
ØL		165 (6.496)	200 (7.878)	220 (8.661)	285 (11.220)	340 (13.386)	405 (15.945)	460 (18.110)	520 (20.472)	580 (22.835)
M		20 (0.787)	22 (0.866)	24 (0.945)	27 (1.062)	28 (1.102)	28 (1.102)	28 (1.102)	30 (1.181)	32 (1.260)
P	ND 6	4	4	4	8	8	12	12	12	16
	ND 10	4	8	8	8	8	12	12	16	16
	ND 16	4	8	8	8	12	12	12	16	16
	ASA 125 lb	4	4	8	8	8	12	12	12	16
	JIS 5K	—	—	8	8	8	—	12	—	—
	JIS 10K	—	—	8	8	8	—	—	—	—
Q	ND 6	14 (0.5)	19 (0.7)	19 (0.7)	19 (0.7)	19 (0.7)	18 (0.7)	22 (0.9)	22 (0.9)	22 (0.9)
	ND 10	18 (0709)	18 (0709)	18 (0.709)	23 (0.905)	23 (0.905)	22 (0.866)	22 (0.866)	22 (0.866)	26 (1.024)
	ND 16	18 (0.709)	18 (0.709)	18 (0.709)	23 (0.905)	23 (0.905)	26 (1.024)	26 (1.024)	26 (1.024)	30 (1.181)
	ASA 125 lb	19 (0.748)	19 (0.748)	19 (0.748)	23 (0.905)	23 (0.905)	25.4 (1.000)	25.4 (1.000)	28.6 (1.125)	28.6 (1.125)
	JIS 5K	—	—	19 (0.7)	19 (0.7)	23 (0.9)	—	23 (0.9)	—	—
	JIS 10K	—	—	19 (0.7)	23 (0.9)	23 (0.9)	—	—	—	—
T		405 (15.945)	440 (17.323)	560 (22.047)	709 (27.913)	849 (33.425)	854 (34.055)	1090 (42.91)	1165 (45.866)	1285 (50.590)

APPROXIMATE WEIGHT OF VALVE Kg (lbs)

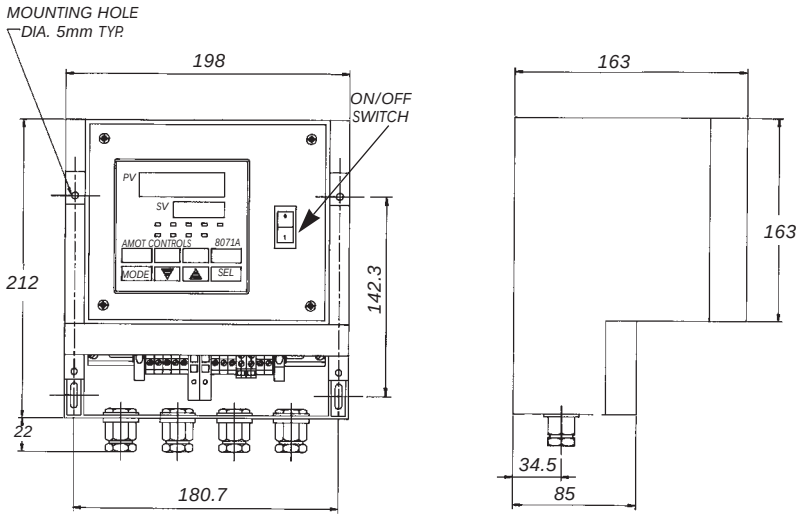
Material	2GPD	3GPD	4GPD	6GPD	8GPD	10GPD	12GPD	14GPD	16GPD
Cast Iron	19 (43)	29 (65)	34 (76)	82 (184)	142 (319)	183 (411)	289 (649)	429 (964)	583 (1310)
Bronze	21 (47)	32 (72)	41 (92)	96 (216)	160 (360)	205 (460)	313 (703)	479 (1076)	679 (1525)
Material	**2GED**	**3GED**	**4GED**	**6GED**	**8GED**	**10GED**	**12GED**	**14GED**	**16GED**
Cast Iron	22 (49)	32 (72)	37 (83)	86 (193)	146 (328)	187 (420)	295 (663)	435 (977)	575 (1292)
Bronze	24 (54)	35 (79)	44 (99)	100 (225)	164 (368)	209 (470)	319 (717)	485 (1089)	671 (1507)

CONTROL SYSTEM DIMENSIONS AND MOUNTING DETAILS

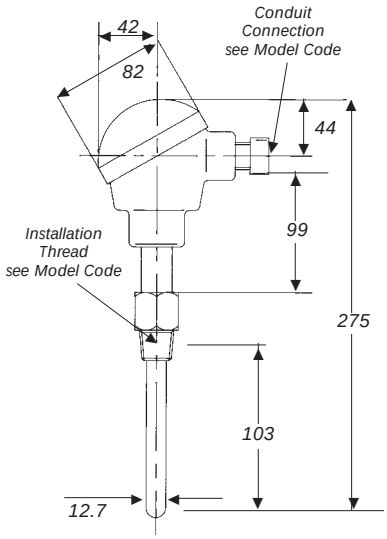
VALVE CONTROLLER 8071



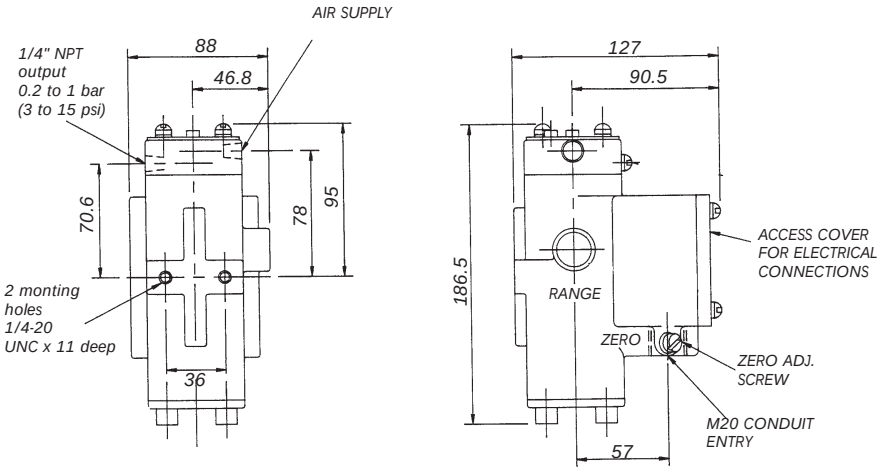
VALVE CONTROLLER 8072



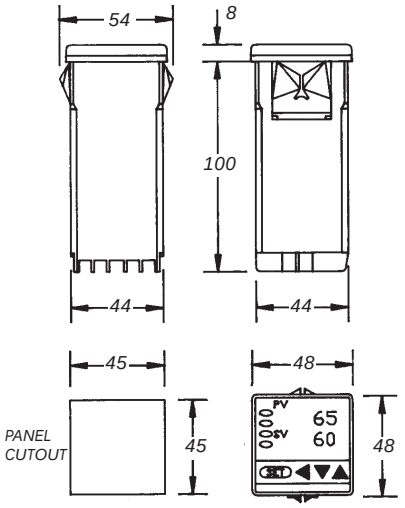
PROBE 8060



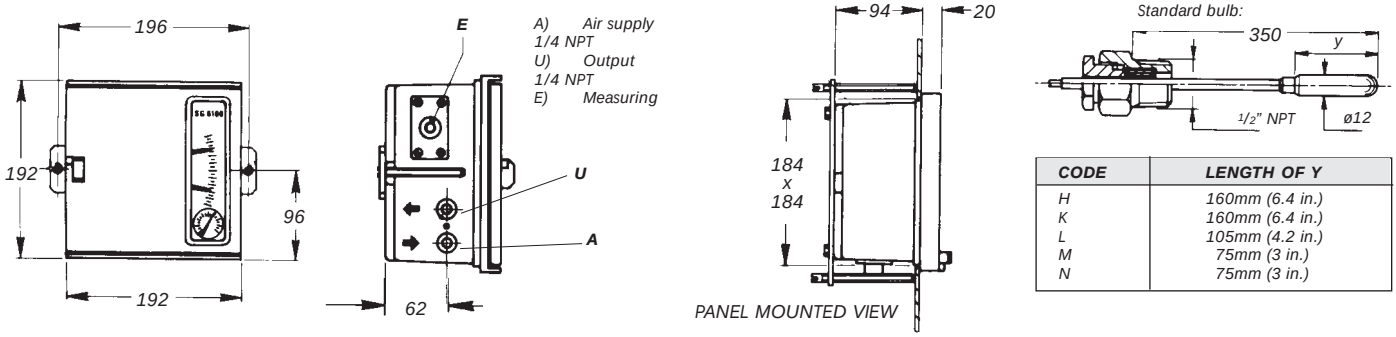
I/P CONVERTER 8064



CONTROLLER 8061



PNEUMATIC INDICATOR/CONTROLLER SG6100



CODE	LENGTH OF Y
H	160mm (6.4 in.)
K	160mm (6.4 in.)
L	105mm (4.2 in.)
M	75mm (3 in.)
N	75mm (3 in.)

VALVE SIZING

Pressure Drop

Model G Valves are designed to produce minimal pressure drop. The normal recommendation in sizing AMOT G valves is a pressure drop between 0.01 to 0.1 bar (0.145 and 1.45 psi).

Valve Flowrate

A Kv is the valves flow coefficient (Kv), it is defined as the number of metres cubed per hour of room temperature water which will flow through the valve with a pressure drop of 0.069 Bar across the valve (Cv is the imperial coefficient).

The basic formula to find a valves Kv is shown below.

$$Kv = Q\sqrt{\frac{SG}{Dp}}$$

Q = Flow in m³/hr
Dp = Pressure Drop in Bar
SG = Specfic gravity of fluid (Water = 1.0)
Kv = Valve flow coefficient

There are two other ways that this formula can be used to find the flow in m³/hr and to find the pressure drop of a valve in Bar.

$$Q = Kv\sqrt{\frac{Dp}{SG}} \qquad Dp = \left(\frac{Q}{Kv}\right)^2 SG$$

Examples

To find the ideal Kv of a valve required to pass 280m³/hr of water with a pressure drop of 0.03 Bar across the valve.

$$Kv = Q\sqrt{\frac{SG}{Dp}} \qquad 280\sqrt{\frac{1}{0.03}} = \underline{1616}$$

What is the flowrate through a valve having a Kv of 1296 and a pressure drop of 0.03 Bar?

$$Q = Kv\sqrt{\frac{Dp}{SG}} \qquad 1296\sqrt{\frac{0.03}{1}} = \underline{224 m^3/hr}$$

Water is flowing at 145 m³/hr through a valve having a Kv of 207, what is the pressure drop across the valve?

$$Dp = \left(\frac{Q}{Kv}\right)^2 SG \qquad \left(\frac{145}{207}\right)^2 \times 1.0 = \underline{0.49 \text{ Bar}}$$

The basic formula to find a valves Cv is shown below.

$$Cv = Q\sqrt{\frac{SG}{Dp}}$$

Q = Flow in US gallons per minute
Dp = Pressure Drop (Psi)
SG = Specfic gravity of fluid (Water = 1.0)
Cv = Valve flow coefficient

There are two other ways that this formula can be used to find the flow in US gallons per minute and to find the pressure drop of a valve in Psi.

$$Q = Cv\sqrt{\frac{Dp}{SG}} \qquad Dp = \left(\frac{Q}{Cv}\right)^2 SG$$

Examples

To find the ideal Cv of a valve required to pass 350 usgpm of water with a pressure drop of 1 psi across the valve.

$$Cv = Q\sqrt{\frac{SG}{Dp}} \qquad 350\sqrt{\frac{1}{1}} = \underline{350}$$

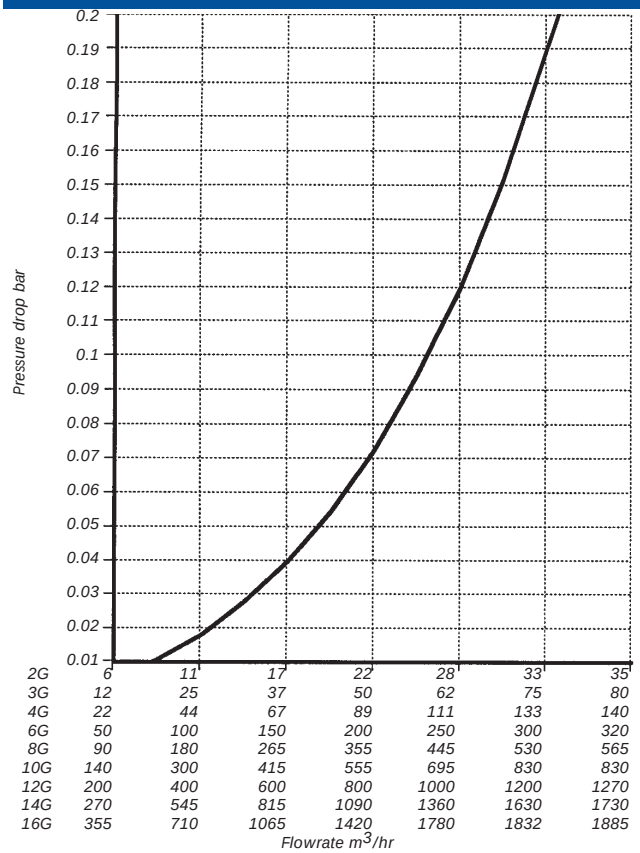
What is the flowrate through a valve having a Cv of 378 and a pressure drop of 1 Psi?

$$Q = Cv\sqrt{\frac{Dp}{SG}} \qquad 378\sqrt{\frac{1}{1}} = \underline{378 \text{ usgpm}}$$

Water is flowing at 640 usgpm through a valve having a Cv of 851, what is the pressure drop across the valve?

$$Dp = \left(\frac{Q}{Cv}\right)^2 SG \qquad \left(\frac{640}{851}\right)^2 \times 1.0 = \underline{0.56 \text{ Psi}}$$

G VALVE FLOWRATE SELECTION



The valve selection graph shown opposite is intended for use with water only, for other fluids use the sizing calculations shown on page 20.

To ensure stable control the valve should be selected to provide a pressure drop with full flow of between 0.01 and 0.1 bar (0.1 and 1.4 psi).

Note: pressure drops are in bar and flow rates are in cubic metres per hour. For conversion factors to most other common units refer to page 23.

To use the graph it is recommended to use the following method.

1. Start with a pressure drop of 0.05 bar on the vertical axis, read across to the curve.
2. Follow this line down to the flow rates below until you find the value closest to your flowrate.
3. Follow the line across to the left to determine suitable valve size.

G VALVE Kvs and Cvs

Valve Size	Flow Coefficient Kv	Cv
2G	82	96
3G	207	242
4G	323	378
6G	729	851
8G	1296	1513
10G	2025	2364
12G	2918	3405
14G	3972	4635
16G	5187	6053

Examples and calculations shown for water. For other fluids see page 20.

VISCOSITY CORRECTION

For selecting valves with viscosity other than water, a correction factor to the formula is needed.

1 *Viscosity: Find the viscosity of the fluid. The graph below is in centistokes (cSt). ISO grade oil is the viscosity in centistokes, i.e. ISO VG 46 = 46 centistokes at 40˚C.*

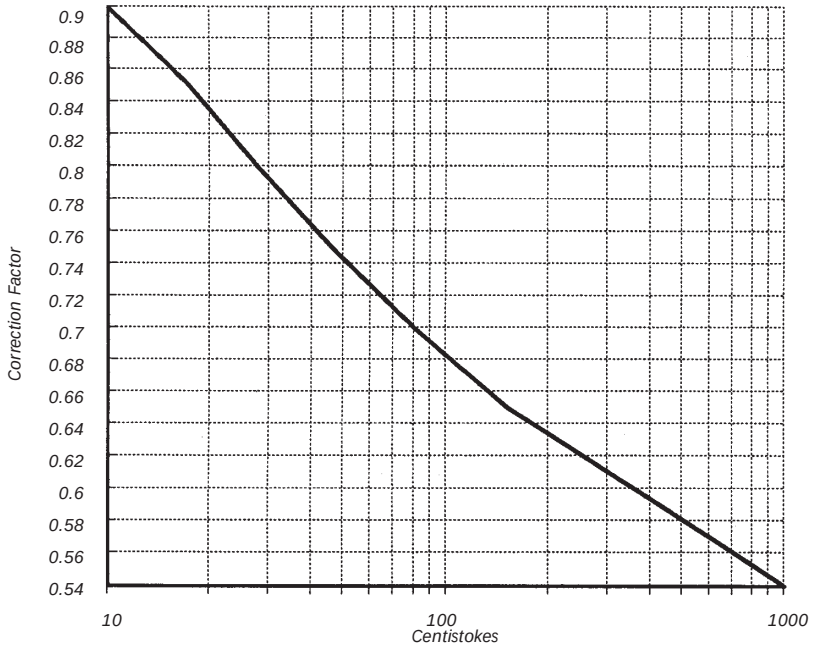
2 *Viscosity Correction: Using the graph below the coefficient correction factor can be established. The correction value is then multiplied by the original Kv or Cv. This gives the corrected coefficient which should be used in the formulas as the flow coefficient value.*
Example 100 CST = correction factor of 0.68
0.68 x flow coefficient = corrected flow coefficient (Kv or Cv)

SAE OILS VISCOSITIES

Approximate viscosities of SAE oils at 40˚C (cSt)

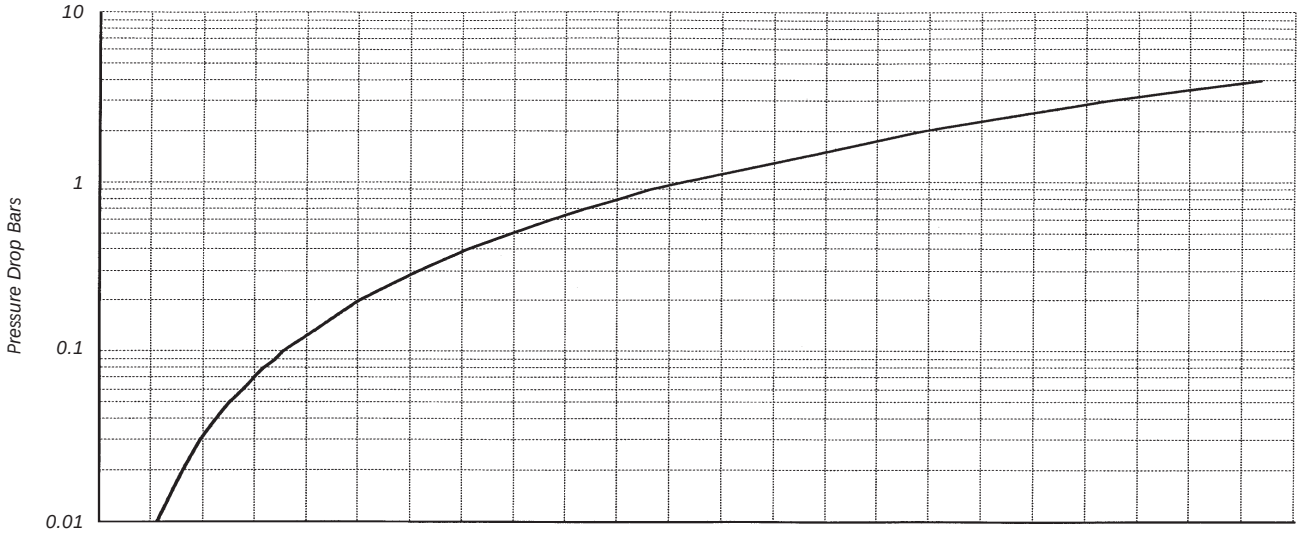
ENGINE OILS	SAE 5W	6.8
	SAE 10W	32
	SAE 20	46
	SAE 20W	68
	SAE 30	100
	SAE 40	150
	SAE 50	220
GEAR OILS	SAE 75W	22
	SAE 80W	46
	SAE 85W	100
	SAE 90	150
	SAE 140	460

VISCOSITY CORRECTION GRAPH



G VALVE BYPASS FLOWRATES

AMOT G valves allow a certain amount of leakage past their metal seat. The amount of leakage will vary due to the amount of pressure on the valve, typical leakage amounts are shown below.



2G	0.05	0.07	0.09	0.1	0.11	0.12	0.13	0.14	0.15	0.16	0.23	0.28	0.32	0.36	0.4	0.43	0.46	0.48	0.51	0.72	0.88	1.02
3G	0.08	0.12	0.14	0.16	0.18	0.2	0.22	0.23	0.25	0.26	0.37	0.45	0.52	0.58	0.64	0.69	0.73	0.78	0.82	1.16	1.42	1.64
4G	0.17	0.25	0.3	0.35	0.39	0.43	0.4	0.49	0.52	0.55	0.78	0.95	1.1	1.23	1.35	1.46	1.56	1.65	1.74	2.46	3.01	3.48
6G	0.31	0.44	0.54	0.63	0.7	0.77	0.83	0.89	0.94	0.99	1.4	1.71	1.98	2.21	2.42	2.62	2.8	2.97	3.13	4.43	5.42	6.26
8G	0.45	0.64	0.79	0.91	1.01	1.11	1.2	1.28	1.36	1.43	2.03	2.48	2.87	3.2	3.51	3.79	4.05	4.3	4.53	6.41	7.85	9.06
10G	0.58	0.82	1.01	1.16	1.3	1.42	1.54	1.64	1.74	1.84	2.6	3.19	3.68	4.11	4.5	4.87	5.2	5.52	5.82	8.22	10.0	11.6
12G	0.83	1.18	1.44	1.67	1.86	2.04	2.21	2.36	2.5	2.64	3.73	4.57	5.27	5.89	6.46	6.97	7.46	7.91	8.34	11.7	14.4	16.6
14G	1.03	1.46	1.79	2.06	2.31	2.53	2.73	2.92	3.09	3.26	4.61	5.65	6.52	7.29	7.99	8.63	9.22	9.78	10.3	14.5	17.8	20.6
16G	1.32	1.87	2.28	2.64	2.95	3.23	3.49	3.73	3.96	4.17	5.9	7.22	8.34	9.33	10.2	11.0	11.8	12.5	13.1	18.6	22.8	26.3

Leakage Rate m3/hr

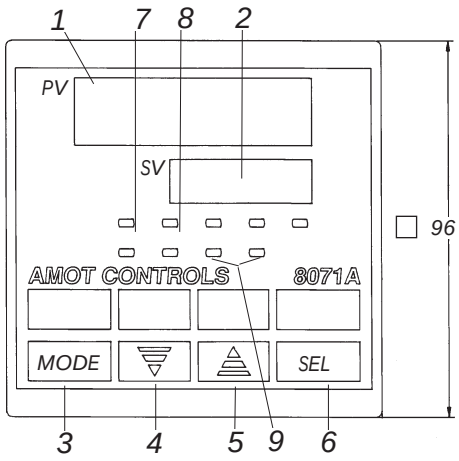
ELECTRIC CONTROLLER FUNCTIONS – 8071 & 8072

1 Measured Value (PV) Display Unit
Actual process temperature is displayed on the 4-digit, 7-segment LED's. In addition, setting modes are displayed.

2 Set Value (SV) Display Unit
Each set value is displayed on the 4-digit, 7-segment LED's. All items which can be set are displayed on this unit.

3 MODE Key
Used for calling up the auto/manual change screen or for changing from other setting groups to the monitoring screen.

4 DOWN (▽) Key
Used for lowering the set value. Hold key to decrease the speed of numeric value change. Also used to select either auto or manual operation.



5 UP (△) Key
Used for raising the set value. Hold key to increase the speed of numeric value change. Also use to select either auto or manual operation.

6 SEL Key
Used for calling up the engineer's setting group. The controller enters the initial set mode when this key is used together with the MODE key.

7 OUT1 AND OUT2 LEDS
These illuminate when the motor is energised.

8 SV2
This led will illuminate when the 2nd setpoint switch is on.

9 Alm1 and Alm2
These leds are illuminated when optional alarm is activated.

CONTROLLER SET-UP

Upon receipt of your controller, it is important to note that the unit has been factory configured to suit most industrial applications. This ensures minimal set-up. However, locking and unlocking the unit along with changing the set point plus setting appropriate motor time will be necessary, see below.

IMPORTANT: All instructions are to be carried out from the initial Display that normally indicates set and process values.

LOCKING/UNLOCKING

The set data can be locked to avoid accidental change or tampering. To change any settings the controller must be unlocked. To lock or unlock the unit follow these steps:

- *Press mode button (until LCK and UnCK appears).*
- *Select lock or unlock using △ ▽ keys. (Selected option will be brighter and not flickering)*
- *Press select (to confirm setting and return to initial screen)*

MOTOR TIME SETTING (MoT)

In order for the valve to perform at maximum efficiency, it will be necessary to adjust the motor time according to the size of the actuator.

The motor time is adjusted by:

- *Ensure unit is unlocked*
- *Press the sel button until PG1 appears*
- *Use the △ ▽ keys to scroll to PG6*
- *Use select button to scroll through PG6 and the △ ▽ keys to adjust the motor time.*
- *Press mode to confirm setting and to return to initial display*

NOMINAL BORE	MOT (Motor Time)
2", 3" and 4"	6 seconds
6", 8" and 10"	9 seconds
12", 14" and 16"	20 seconds

TEMPERATURE SET POINT (Range 0 to 120˚C) (32 to 250˚F)

- *Check unit is unlocked and return to initial screen*

Setpoint 1 *(Factory set at 60˚C)*
- *To increase temperature press △*
- *To decrease temperature press ▽*

Setpoint 2 *(Factory set at 80˚C)*
Press select (SV2 displayed)
- *To increase temperature press △*
- *To decrease temperature press ▽*

PID

- *Ensure the unit is unlocked*
- *Press the set button until PG1 is displayed*
- *Use △ ▽ to scroll to PG5*
- *Use the select button to scroll through PG5 menu and the △ ▽ keys to make adjustments to:*

SYMBOL	NAME	FACTORY SET
P	Proportional Band	10
I	Integral Time	120
D	Derivative Time	30
db	Deadband	10
rPT	Control Response	0

PID SETTINGS AND CHANGES

In the unlikely event that control system does not provide optimum performance it is possible that the Proportional, Integral and Derivative (PID) functions may require tuning to meet the system needs.

AUTO/MANUAL OPERATION

- *Check unit is unlocked*
- *Press mode button (to display Auto/Man)*
- *Select Auto or Manual using △ ▽ keys. (Selected option will be brighter and not flickering)*
- *Press mode to confirm setting and to return to initial display*
- *If in manual mode, by pressing △ ▽ keys you can open or close the valve in either clockwise or anti-clockwise direction*

PRECONFIGURED SETTINGS

The controller has preconfigured settings. Please refer to the table below for factory settings. These settings should not normally need altering and should be left as factory set with the exception of Temperature Setpoint and PID Terms.

SETTING

SYMBOL	FACTORY SET
InP	29
Sch	120˚C (250˚F)
SCL	0˚C (32˚F)
PGdP	0
Man	1
STOP	0
AoHE	2*

** This function is used to set the Action selection at abnormality.*

0: Open-side output OFF, closed-side output OFF
1: Open-side output OFF, closed-side output ON
2: Open-side output ON, closed-side output OFF

OPERATOR MODE

SYMBOL	NAME	DESCRIPTION
AUTO	Auto/manual Transfer	Auto Valve Control
MAN		Manual Valve Control

ENGINEER MODE

SYMBOL	NAME	DESCRIPTION
UnCK		If "unlock" is selected, data is unlocked
LCK	Lock Transfer	If "lock" is selected, data is locked

OPERATOR SET MODE

SYMBOL	NAME	SETTING RANGE	FACTORY SET
PG1	Parameter Group 1	N/A	–
P6	PV bias	N/A	0
PG2	Parameter Group 2	N/A	–
SUrL	Sl/change rate limited	N/A	0
PG3	Parameter Group 3	N/A	–
PG4	Parameter Group 4	N/A	–
PG5	Parameter Group 5	N/A	–
P	Proportional band	Temperature 0.1 to 120˚C Voltage output 0.1 to 100% of span	10
I	Integral time	1-3600 seconds	120
d	Derivative time	0-3600 seconds	30
db	Deadband	0.1 to 10%	10
rPT	Control response designation parameter	0: Slow 1: Medium 2: Fast	0
PG6	Parameter Group 6	N/A	_
Mot*	Motor Time Setting	5-1000 seconds	6
oLA	Integrated output limit	100% to 200%	150.0
oSl	Direct/reverse action	O: Direct action 1: reverse action	0
PG7	Parameter Group 7	N/A	_
PG8	Parameter Group 8	N/A	_

** Never change the motor time during control. If the motor time is set during control, control may be disturbed.*

SYMBOL	NAME	FACTORY SET
SV1	Set-Value	60
SV2	Step Set-Value	80

ELECTRONIC CONTROLLER FUNCTIONS – 8061

User adjustments
The only adjustments necessary by the user are as follows.

Temperature controller model 8061A

a) ***Locking of input data/settings*** *(restriction of unauthorised adjustment)*
b) ***Temperature set point*** *(desired control temperature)*
c) ***Auto-tune start and stop*** *(automatic adjustment of proportional, integral and derivative functions)*
d) ***PID terms*** *(manual adjustment of proportional, integral and derivative functions)*

Setting the Lock Code
The locking functions allows only the set point to be altered once activated. Press the "SET" button for 5 seconds or until display starts flashing. Press "SET" 5 TIMES. Change display to read the desired Lock Code.
Press "SET" for 5 seconds until display reverts back to normal.

SYMBOL	ITEM	SETTING	DESCRIPTION
L C K	Set data lock selection	0 1 0 0	No set data locked
		0 1 0 1	All data locked
		0 1 1 0	All data locked except for Temperature set point

Establishing the Set Point
Press the "SET" button once. This activates the lower display. When the lower display is actuated, the display will flicker and have less intensity. One digit in the display willl remain bold and not flicker. This digit value can be changed by using either the ▼ button to lower the value or the ▲ button to raise the value. Press the ◀ button once to carry out the same procedure on the digit to the left of the previous one. Once the desired set point has been inserted, press "SET" once.

To initiate the Auto Tune Function
NB. Lock must be set to 0100 to do auto-tune.

SYMBOL	ITEM	SETTING	DESCRIPTION
A T U	Auto-Tune	0	Stop Auto-Tune
		1	Start Auto-Tune

Press the "SET" button for 5 seconds until the display can be seen to alter. Display will read "A T U". Using the same procedure in "Establishing The Set Point", change the digits to read 0 0 0 1. Press the "SET" button once. This will then cause the green LED to flicker (AT). Press the "SET" button for 5 seconds until display reverts back to normal. The green (AT) LED will continue to flicker until AUTO TUNE is complete.

ELECTRICAL TERMINAL CONNECTIONS

8071 Wiring
Terminal Numbers

1 Live
2 Neutral } 100-240 VAC Supply
3 Live Input
4 Live Output to Actuator (Terminal 5)

9
10 C — R — PT 100 input (3 wire)
11

14 Live Input
15 Live Output to Actuator (Terminal 8) — Set point selection
19

8072A or B Wiring

1	Set point select — Open Contact Set Point 1, Closed Contact Set Point 2
2	
3	
4	PT 100 input (3 wire) (C, R)
5	
6	Controller fuse 1A } No external connections
7	Actuator fuse 5A } No external connections
8	Live actuator terminal 8
9	Live actuator terminal 5
10	Neutral actuator terminal 4
11	Actuator earth
12	Earth
13	Neutral } Mains supply in
14	Live } Mains supply in

8060 Wiring

RED
RED
WHITE

8061 Wiring

8060A RTD Input

10 — R — C
9
8

Main Power Supply In

Neutral — 7
Live — 6

4-20MA Output to 8064A

Negative – — 5
Positive + — 4

8073A Wiring

CONTROL INPUTS
- OPEN — 1
- POWER SUPPLY — N — 2, L — 3
- SWITCHED OUTPUTS — CLOSE — 4, OPEN — 5
- CLOSE — 6

8064 Wiring

– } 4 to 20mA
+

PRESSURE CONVERSION

	PSI	Bar	KG/cm^2	Atm	Kpa	In. water	In. merc
PSI	*****	0.069	0.070	0.068	6.89	27.68	2.04
BAR	14.50	*****	1.020	0.987	100.00	401.46	29.53
KG/cm^2	14.22	0.981	*****	0.968	98.06	393.67	28.96
Atm	14.70	1.013	1.033	*****	101.32	406.79	29.92
Kpa	0.15	0.010	0.010	0.010	*****	4.01	0.30
In. water	0.04	0.002	0.003	0.002	0.25	*****	0.07
In. merc	0.49	0.034	0.035	0.033	3.39	13.60	*****

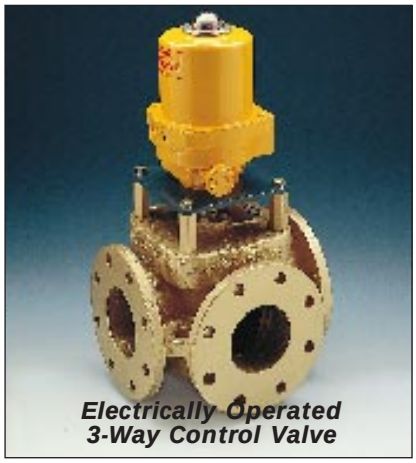
FLOWRATE CONVERSION

	m^3/hr	Litre/min	IMP Gallon/min	US Gallon/min
m^3/hr	–	16.67	3.666	4.4
Litre/min	0.06	–	0.220	6.264
IMP Gallon/min	0.2728	4.546	–	1.2
US Gallon/min	0.227	3.787	0.833	–

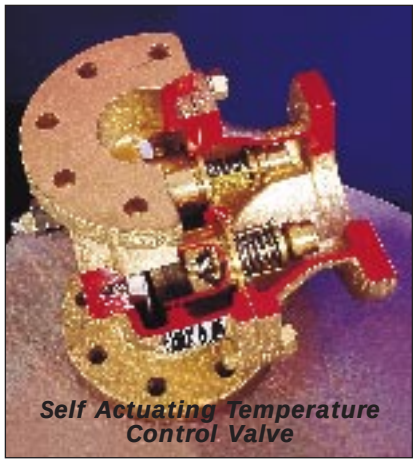
TEMPERATURE CONVERSION TABLE

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
10	50.0	22	71.6	34	93.2	46	114.8	58	136.4	70	158.0	82	179.6	94	201.2	106	222.8	118	244.4
11	51.8	23	73.4	35	95.0	47	116.6	59	138.2	71	159.8	83	181.4	95	203.0	107	224.6	119	246.2
12	53.6	24	75.2	36	96.8	48	118.4	60	140.0	72	161.6	84	183.2	96	204.8	108	226.4	120	248.0
13	55.4	25	77.0	37	98.6	49	120.2	61	141.8	73	163.4	85	185.0	97	206.6	109	228.2	121	249.8
14	57.2	26	78.8	38	100.4	50	122.0	62	143.6	74	165.2	86	186.8	98	208.4	110	230.0	122	251.6
15	59.0	27	80.6	39	102.2	51	123.8	63	145.4	75	167.0	87	188.6	99	210.2	111	231.8	123	253.4
16	60.8	28	82.4	40	104.0	52	125.6	64	147.2	76	168.8	88	190.4	100	212.0	112	233.6	124	255.2
17	62.6	29	84.2	41	105.8	53	127.4	65	149.0	77	170.6	89	192.2	101	213.8	113	235.4	125	257.0
18	64.4	30	86.0	42	107.6	54	129.2	66	150.8	78	172.4	90	194.0	102	215.6	114	237.2	126	258.8
19	66.2	31	87.8	43	109.4	55	131.0	67	152.6	79	174.2	91	195.8	103	217.4	115	239.0	127	260.6
20	68.0	32	89.6	44	111.2	56	132.8	68	154.4	80	176.0	92	197.6	104	219.2	116	240.8	128	262.4
21	69.8	33	91.4	45	113.0	57	134.6	69	156.2	81	177.8	93	199.4	105	221.0	117	242.6	129	264.2

Temperature Control



Electrically Operated 3-Way Control Valve

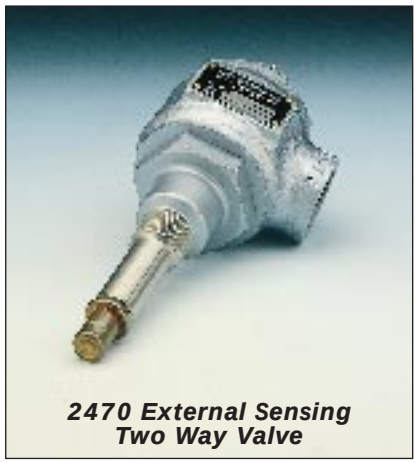


Self Actuating Temperature Control Valve

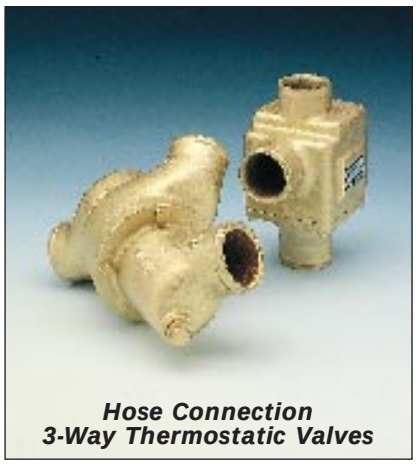
Pneumatic Operated 2 & 3 way Control Valves

Pneumatically Operated 3-Way Control Valve

Self Actuating Inter Cooling Thermostat



2470 External Sensing Two Way Valve



Hose Connection 3-Way Thermostatic Valves

Filter Housings With Internal Thermostat

4106 Thermohydraulic Valve

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