Transmitter FUS080/FUE080

Overview

SITRANS FUS080 is a transit time based transmitter designed for ultrasonic flowmetering with any sensor in the FUS inline series SONOKIT, FUS380 and FUE380 up to DN 1200.

The ultrasonic flowmeter transmitter SITRANS FUS080 comes as battery or mains powered version.The SITRANS FUS080 is designed to measure flow water applications.

The SONOKIT retrofit flowmeter series are shown from page 4/240. The standard flowmeter series SITRANS FUS380 is described from page 4/251. The type approved flowmeter series for flowmetering in energy meter custody transfer systems are named SITRANS FUE380 - see page 4/256.

Benefits

- Battery powered up to 6 years
- 115/230 V mains powered with back-up battery option in case of mains power failure
- Fast measuring frequency 20 Hz/0.5 Hz (230 V AC/Battery)
- Easy one button straight forward display
- IrDA optical interface for local communication
- 2-track measuring principle for optimum accuracy
- Compact or remote mounting
- Measures on all district water qualities and water conductivities
- No pressure drop
- Long-term stability
- 2 galvanic isolated digital outputs for easy connection to a calculator (potential free)
- Bidirectional measurement, with 2 totalizers and outputs
- Dynamic range Q_i (min) : Q_s (max) up to 1:400
- Modbus RTU/RS 232, RS 485 communication modules

Application

The main application for flowmeters with the transmitter SITRANS FUS080 is measurement of water flow in district heating plants, local networks, boiler stations, substations, chiller plants, irrigations plants and other general water applications.

Design

The transmitter type SITRANS FUS080 is designed with fiberglass reinforced polyamide enclosure for remote or compact installation in normal areas. The remote versions are available with up to 30 meter distance from flowmeter to transmitter. When ordering as a compact version in the series FUS380 and FUE380 the transducer cables are pre-mounted at the sensor.

The transmitter is available in an IP67/NEMA 4X/6 enclosure and is designed for use in the flowmeters series:

- SONOKIT (1- or 2-track)
- FUS380 (2-track)
- FUE380 (2-track)

The transmitter FUS080 is always ordered as part of a complete flowmeter system.

It can be manually ordered separately as spare part preprogrammed with the given sensor data.

Integration

The flowmeter digital output is often used as input for an energy meter or as input for digital systems for remote reading.

SITRANS FUS380 has two digital output functions that can be individually selected, and optional Modbus RTU communication modules.

The settings of the transmitter, eg. flow and pulse output rate, are defined when ordering the complete flowmeter.

If the flowmeter forms part of an energy meter system for custody transfer, no further approvals are needed, except eventually local approvals on the flowmeter.

Technical specifications

Input	
Measurement	Flow by measuring the transit time difference of ultrasonic signals through transducers in DN 50 ... 1200 2-track sensor pipes (optional also as SONOKIT 1-track)
Measuring rate	
• Battery mode	0.5 Hz
• Mains supply	up to 15 Hz
• Back-up mode	0.5 Hz (at mains supply drop)
Flow rate	0.02 ... 9 m/s (0.065 ... 29.5 ft/s), bidirectional flow metering
Outputs	2 pulse or status outputs (A and B), individual galvanically isolated MOS relay outputs, passive mode, max. ±35 V AC/DC, max. 50 mA
Max. pulse frequency	100 Hz at Q_s (Q_{max})
Pulse value and length	Selectable with the ordering of the flowmeter
Output A	Pulse: forward, reverse, forward net, reverse net (preset: forward)
Output B	Pulse: forward, reverse, forward net, reverse net (preset: forward) or alarm indication or call-up indication (preset: alarm)
Pulse value A and B	0.1 l/p, 0.25 l/p, 0.5 l/p, 1 l/p, 2.5 l/p, 10 l/p, 25 l/p, 50 l/p, 100 l/p, 250 l/p, 500 l/p, 1 m^3/p, 2.5 m^3/p, 5 m^3/p, 10 m^3/p, 25 m^3/p, 50 m^3/p, 100 m^3/p, 250 m^3/p, 500 m^3/p, 1 000 m^3/p
Pulse length (depending on Q_{max} by DN selection)	5, 10, 20, 50, 100, 200, 500 ms
Alarm indication	Track 1 (F1), track 2 (F2) internal, failure (F3, F4), powers supply warning or low battery indication (F5), Q_{max} overflow (F6), pulse overflow (F7, F8), internal data logger warning (F9)

Transmitter FUS080/FUE080

Rated operation conditions	
Ambient conditions	
Ambient temperature	
• Operation	-5 ... +60 °C (23 ... 140 °F)
• Storage	-40 ... +85 °C (-40 ... 185 °F) (battery included)
Enclosure rating	IP67/NEMA 4X/6 to EN 60529 and DIN 40050
Electromagnetic compatibility	
• Emitted interference	To EN 61000-6-4
• Immunity	To EN 61000-6-2
• MID approved (FUE380 series)	Environment class E2 and M1
Mechanical vibration	2 g, 1 ... 800 Hz sinusoidal in all directions according to IEC 68-2-6
Weight of transmitter	Approx. 1.5 kg (3.3 lb)
Design	
Enclosure material	Fibre-glass reinforced polyamide, light gray color
Wall mounting kit	IP67/NEMA 4X/6 terminal box for the wall mounting of the transmitter, fiber-glass reinforced polyamide with stainless steel bracket, cable glands entries: 2 x 2 M20 or Pg 13.5 for power supply and outputs and 2 x M20 or Pg 13.5 for the sensor cables, glands (supply and outputs and double cable entries for sensor cables) are included.
Sensor cable	Coaxial cable sets for remote transmitter up to 30 m (98.4 ft) long transducer cable, 75 Ω impedance, cables sets are prepared for the connection to the sensors
Display and controls	
Display	LCD, 8 digits, additional 2 digits and symbols for status information
Display setting	Flow unit: Preset: m^3/h Volume unit: Preset: m^3
Push button	One push button for menu selection and display information
Communication (IrDA optical eye)	IrDA – optical communication and control interface with Modbus RTU protocol for read or write transmitter settings and data via PC and PDM tool
Power supply	
Battery	D-cell battery pack, 3.6 V LiSOCl (Lithium Thionyl Chloride, 32 Ah), replaceable, life- and working-time up to 8 years
Mains	87 ... 265 V AC (50 ... 60 Hz) or 87 ... 265 V AC (50 ... 60 Hz) with D-cell single battery backup, 2.6 V LiSOCl (Lithium Thionyl Chloride, 12.5 Ah), replaceable, life time up to 8 years
Power consumption	
Mains version	Approx. 2.5 VA
Add-on modules	• RS 232 serial interface with Modbus RTU (Rx/Tx/GND), point to point with max. 15 m cable • RS 485 serial interface with Modbus RTU (+/-/GND), multi-drop with up to 32 devices with max. 1 000 m cable • Modbus RTU protocol is an open protocol (further information available on request) • Serial speed 1 200, 2 400, 4 800, 9 600, 19 200, 38 400 Baud

SONOKIT, FUS380, FUE380

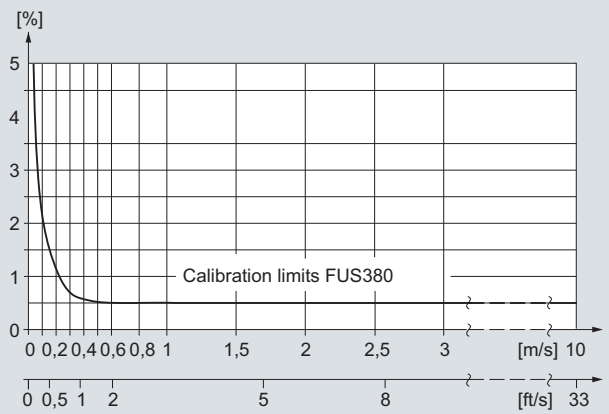
Flow value setting predefined settings according to dimension selection

The transmitter settings are changeable by using the SW tool PDM (for FUE380 series some of the setting are only readable, restriction of the approval requirements).

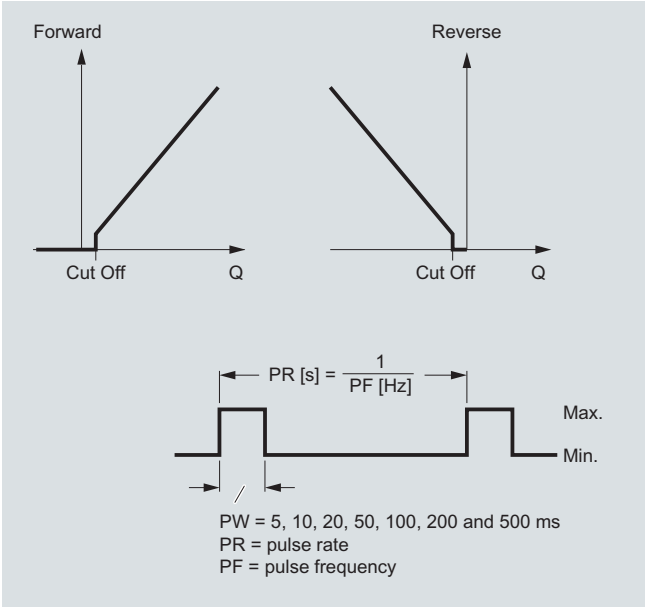
Accuracy/Error in measurement:

(at reference conditions for FUS380 and FUS380 series, SONOKIT series will differ in the accuracy)

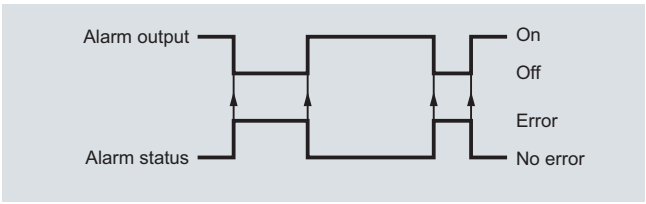
- Pulse output
  - ≤ ±0.5 % of measured value at 0.5 ... 10 m/s or
  - ≤ ±0.25/V [m/s] % of measured value at flow < 0.5 m/s
- Repeatability ≤ 0.25 % of measured value at 0.5 ... 10 m/s
- Reference conditions
  - Process temperature and ambient temperature: 25 °C ± 5 °C (77 °F ± 9 °F)
  - Warming-up time 30 min.
  - Installation conditions: Upstream section > 10 x DN and downstream section > 5 DN



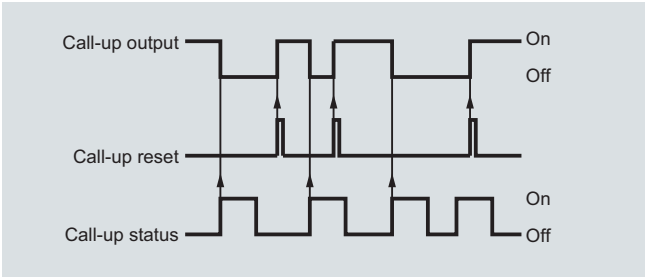
Output configuration



Pulse volume: output A/B configured as volume per pulse, calculated on forward/reverse or net forward/reverse flow. The volume per pulse is free scaleable (via PDM software).



Pulse output B can be used as stated above or as alarm or call-up function.



Call-up: the call-up output is active until manually reset by use of PDM tool. The call-up function is activated when an alarm is activated.

Sensor coaxial cable for SONOKIT series with FUS080

Coaxial cable		
Standard coaxial cable (75 Ω)		
Outside diameter	Ø 5.8 mm	
Length	15, 30 m (49.2, 98.4 ft) between sensor and transmitter	
Material (outside jacket)	black PE	
Ambient temperature	-10 ... +70 °C (14 ... 158 °F)	

Sensor coaxial cable for FUS380/FUE 380 series

Coaxial cable		
High temperature coaxial cable (75 Ω)	With special designed glands for connection in the sensor/transducer	
Outside diameter	Ø 5.13 mm (first 0.3 m (0.98 ft) part to the transducer), Ø 5,8 mm (for remaining cable to the transmitter – black holt melt junction part between (Ø 16 mm, length 70 mm)	
Length	up to 30 m (98.4 ft) between sensor and transmitter	
Material (outside jacket)	Brown PTFE (0.3 m (9.84 ft) part) and black PE (for remaining cable)	
Ambient temperature	-200 ... +200 °C (-328 ... +392 °F) (brown PTFE transducer part) and -10 ... +70 °C (14 ... 158 °F) (black PE for remaining transmitter cable part)	

Transmitter FUS080/FUE080

Accessories and spare parts for flowmeters based on FUS080

SITRANS FUS080 Spare parts

Spare part transmitter for FUS380 systems (7ME3400)

Description	Order No.	
FUS080 transmitter 3.6V battery (no battery included, to be ordered separate) as spare part transmitter for FUS380 flowmeter series	**A5E02729700**	
FUS080 transmitter 3.6V battery (battery included) as spare part transmitter for FUS380 flowmeter series	**A5E02729035**	
FUS080 transmitter 230V mains as spare part transmitter for FUS380 flowmeter series	**A5E02699309**	
FUS080 transmitter 230V mains with backup-battery as spare part transmitter for FUS380 flowmeter series	**A5E02729610**	

When ordering: Inform on flowmeter order no. and flowmeter serial no. (e.g. 7ME3400-xxxxx-xxxx-Z, XX.... and xxxxxxNxxx)

Spare part transmitter for FUE380 approved systems (7ME3410)

(only with approval marks, no verification – it can be only done as complete flowmeter, means "sensor together with the transmitter)

Description	Order No.	
FUE080 transmitter 3.6V battery (no battery included, to be ordered separate) as spare part transmitter for FUE380 flow-meter series	**A5E02734600**	
FUE080 transmitter 3.6V battery (battery included) as spare part transmitter for FUE380 flowmeter series	**A5E02734568**	
FUE080 transmitter 230V mains as spare part transmitter for FUE380 flowmeter series	**A5E02734539**	
FUE080 transmitter 230V mains with backup-battery as spare part transmitter for FUE380 flowmeter series	**A5E02734585**	

When ordering: Inform on flowmeter order no. and flowmeter serial no. (e.g. 7ME3410-xxxxx-xxxx-Z, XX.... and xxxxxxNxxx)

Spare part transmitter for SONOKIT systems (7ME3210/7ME3220)

Description	Order No.	
FUS080 transmitter 3.6V battery (no battery included, to be ordered separate) as spare part transmitter for SONOKIT flowmeters	**A5E03048726**	
FUS080 transmitter 3.6V battery (battery included) as spare part transmitter for SONOKIT flowmeters	**A5E03048714**	
FUS080 transmitter 230V mains as spare part transmitter for SONOKIT flowmeters	**A5E03048701**	
FUS080 transmitter 230V mains with backup-battery as spare part transmitter for SONOKIT flowmeters	**A5E03048719**	

When ordering: Inform on flowmeter order no. and flowmeter serial no. (e.g. 7ME3220-xxxxx-xxxx-Z, XX.... and xxxxxxNxxx)

Operating instructions for FUS080

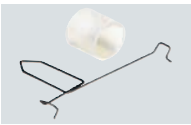
Description	Order No.
Operating instructions for SITRANS FUS080 for use with SONOKIT	
• English	**A5E03059912**
Operating instructions for SITRANS FUS080 integrated in FUS/FUE380	
• English	**A5E00730100**
• German	**A5E00740611**
• Spanish	**A5E00754188**
• French	**A5E00754173**

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
http://www.siemens.com/flowdocumentation

Accessories and spare parts for transmitter FUS080

Description	Order No.	
Dual battery pack (6 year life-time) 33 Ah Attention on note 1)		
• 1 pc. pack	**A5E02679676**	
• 24 pcs. pack	**A5E02896941**	
Single battery back-up to main supply 13.5 Ah Attention on note 1)	**A5E02679923**	
Battery cover for transmitter FUS080	**A5E00694468**	
PG 13.5 set (2 pcs.) for main cable/pulse cable	**FDK:083G0228**	
PG 13.5 set (2 pcs.) for dual coaxial cable (6 mm)	**A5E00694500**	
SITRANS FUS/FUE380 wall mounting kit for remote trans-mitter mounting, including con-nection plate (DN 50 ... DN 1200/2" ... 48")	**A5E00694509**	
SITRANS FUS/FUE380 termi-nal box for compact transmitter mounting, including connec-tion plate, (bronze sensors only, DN 50 ... DN 80/2" ... 3")	**A5E01208138**	
SITRANS FUS/FUE380 termi-nal box for compact transmitter mounting, including connec-tion plate, (steel sensors only, DN 100 ... DN 1200/4" ... 48")	**A5E00694660**	

Description	Order No.	
Sun lid for FUS080 transmitter (frame and lid)	**A5E02328485**	
FUS080 display	**A5E00873496**	
Brace (holder) for optical IrDA eye	**A5E00695277**	
IrDA infrared interface adapter with USB for data acquisition with 1.2 m (3.9 ft) cable	**FDK:087L4163**	
RS 232 add-on module, point to point communication interface with Modbus RTU protocol	**FDK:087L4212**	
RS 485 add-on module, multidrop communication interface with Modbus RTU protocol	**FDK:087L4213**	
Process Device Manager SIMATIC PDM		
SIMATIC PDM Single Point V6.0 For operation and parameterization of one field device, communication using PROFIBUS DP/PA or HART modem, incl. 1 TAG **Cannot** be expanded by further functions or TAG option/power-pack 5 languages (German, English, French, Spanish, Italian) executes with Windows 2000 Professional or Windows XP Professional	**6ES7658-3HX06-0YA5**	

1) Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs.

Downloads for DEVICE description FUE380
http:/support.automation.siemens.com/WW/view/en/17320235

Sensor cables for FUS380/FUE380 flowmeters

Description	Order No.	
DN 50 to 80 flowmeters		
5 m (16.4 ft) cable set (4 pcs.) for DN 50 ... DN 80 (2" ... 3") remote mounting	**A5E01208092**	
10 m (32.8 ft) cable set (4 pcs.) for DN 50 ... DN 80 (2" ... 3") remote mounting	**A5E01208114**	
20 m (65.6 ft) cable set (4 pcs.) for DN 50 ... DN 80 (2" ... 3") remote mounting	**A5E01208117**	
30 m (98.4 ft) cable set (4 pcs.) for DN 50 ... DN 80 (2" ... 3") remote mounting	**A5E01208121**	
1 m (3.28 ft) cable set (4 pcs.) for DN 50 ... DN 80 (2" ... 3") for compact version of FUS380/FUE380	**A5E01208126**	
DN 100 to 1200 flowmeters		
5 m (16.4 ft) cable set (4 pcs.) for DN 100 ... DN 1200 (4" ... 48") remote mounting	**A5E00695476**	
10 m (32.8 ft) cable set (4 pcs.) for DN 100 ... DN 1200 (4" ... 48") remote mounting	**A5E00695479**	
20 m (65.6 ft) cable set (4 pcs.) for DN 100 ... DN 1200 (4" ... 48") remote mounting	**A5E00695480**	
30 m (98.4 ft) cable set (4 pcs.) for DN 100 ... DN 1200 (4" ... 48") remote mounting	**A5E00695483**	
1 m (3.28 ft) cable set (4 pcs.) for DN 100 ... DN 1200 (4" ... 48") for compact version of FUS380/FUE380	**A5E00695486**	

Sensor cables for SONOKIT flowmeter with FUS080

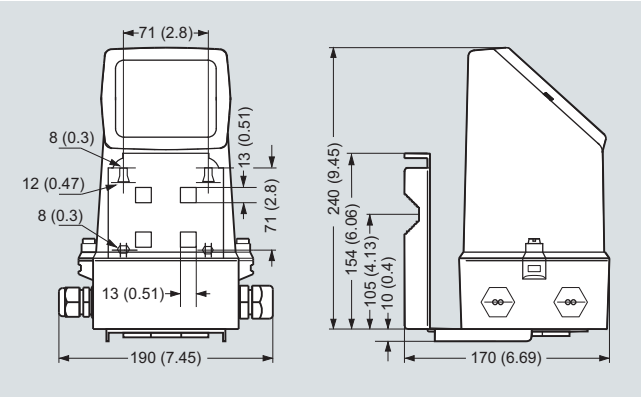
Description	Order No.	
15 m (49.2 ft) cable set (4 pcs.) remote mounting with SONOKIT flowmeters	**A5E02478541**[F)]	
30 m (65.6 ft) cable set (4 pcs.) remote mounting with SONOKIT flowmeters	**A5E02478751**[F)]	

F) Subject to export regulations AL: 9I999, ECCN: N.

Transmitter FUS080/FUE080

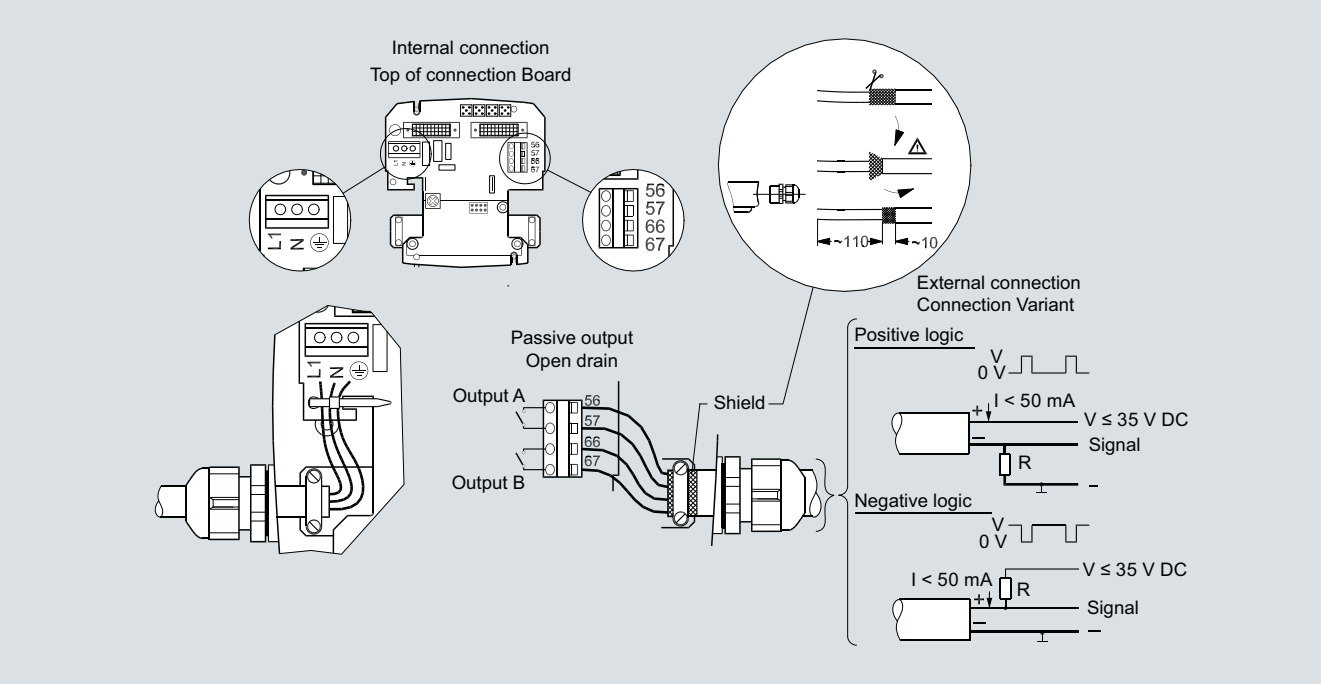
Dimensional drawings

FUS080 transmitter IP67/NEMA 4X/6, wall mounting



DImensions in mm (inch)

Schematics



Electrical connection of SITRANS FUS080

FINE CONTROLS (UK) LTD

Fine Controls have been supplying process controls & instrumentation equipment since 1994, & now serves an ever expanding customer base, both in the UK & globally.

We offer a full range of valve & instrumentation products & services, with our product rangerepresenting leading technologies & brands:

Flow: Flow Meters & Transmitters, Flow Switches, Flow Control Valves & Batch Control Systems

Temperature: Temperature Probes & Thermowells, Temperature ransmitters,Temperature Regulators & Temperature Displays

Level: Level Transmitters & Switches

Pressure: Pressure Gauges &Transmitters, Precision & High Pressure Regulators & I-P Converters, Volume boosters.

Precision Pneumatics: Pressure Regulators, I-P Converters, Volume Boosters, Vacuum Regulators

Valves: Solenoid & Pneumatic Valves, Control Valves & Positioners, Actuated Ball, Globe or Diaphragm Valves & Isolation Valves

Services: Repair, Calibration, Panel Build, System Design & Commissioning

A rotork Brand FAIRCHILD

bürkert

SIEMENS

alcon SOLENOID VALVES

A rotork Brand

MIDLAND-ACS

A rotork Brand

Honeywell

Bourdon Baumer Group

SOLDO CONTROLS

A rotork Brand

Fine Controls (UK) LTD, Bassendale Road, Croft Business Park,
Bromborough, Wirral, CH62 3QL UK
Tel: 0151 343 9966
Email: sales@finecontrols.com