



Cert. No. LRQ 0963008

ISO 9001

# spirax sarco

TI-P335-12  
MI Issue 5

## M640 Steam Mass Flow Transmitter

### Description

The M640 steam mass flow transmitter takes its input from a primary flow element, (orifice plate, Gilflo, or ILVA flowmeter) through impulse lines. It converts the differential and static pressure into a corrected mass flowrate of saturated steam, and outputs this as a single loop powered 4 - 20 mA signal.

#### The M640 transmitter assembly consists of:

- A high accuracy (0.1%) steam mass flow transmitter.
- A 3-way carbon steel isolation manifold.

The M640 is supplied ready assembled.

### Configuration

M640 steam mass flow transmitters are uniquely configured at the factory to work with a single, specific Gilflo, ILVA or M410 orifice plate flowmeter for a specific flow application. For correct operation the configured M640 transmitter must always be installed with its allocated flowmeter. Labels on the packaging give the serial numbers of the matched products.

The M640 can be configured using a HART® communicator which is programmed with the correct protocol.

### Available types and approvals

Three types of M640 are available:

- Standard.
- ATEX/CENELEC approved.
- FM/CSA approved.

#### Standard version:

- Not intrinsically safe.

#### Intrinsically safe versions:

- **ATEX/CENELEC**  
ATEX (Ex) II 1 G and CENELEC Eex ia IIC T6 T5 T4.
- **CSA/FM**  
DIV I CLASS I Groups A, B, C and D.  
DIV I CLASS II Groups A, B, C and D.  
DIV I CLASS III.

#### All M640's comply with:

- **EN 50081-1:1992**  
EMC Generic Emission Standard - Residential, Commercial, and Light Industrial
- **EN 61000-6-2:1999**  
EMC Generic Immunity Standard - Industrial Environment.

#### Following the provisions of Directives:

- 89/336/EEC Electromagnetic Compatibility, amended by 92/31/EEC and 93/68/EEC.

### Optional extras

An in-head display kit is available to order for fitting to M640 transmitters.

It provides a full density-compensated local display of rate and total saturated steam flow.

The kit consists of an LCD display module and end cover with sight glass. The glazed cover replaces the plain M640 end cover.

### Associated equipment

Gilflo flowmeters  
ILVA flowmeters  
M410 orifice plate flowmeters  
M700 flow indicators  
Optional local display

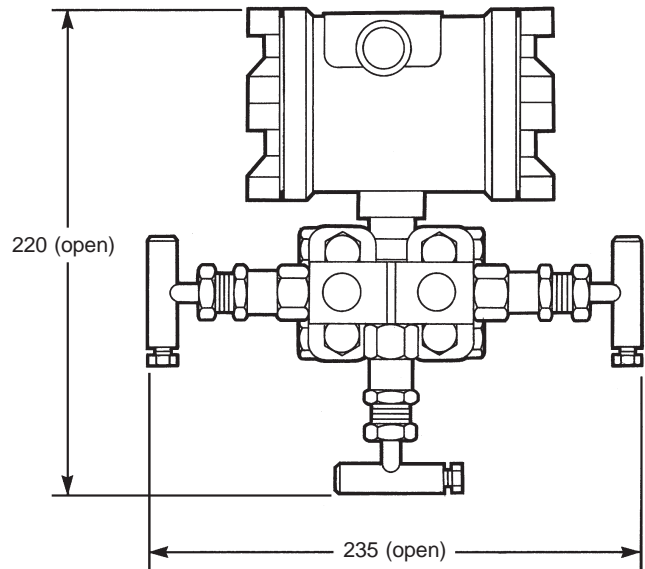
### Pipe connections

The process ports on the 3-way manifold are threaded 1/2" NPT at 54 mm centres.

### Electrical connections

M20 x 1.5	Non approved and ATEX/CENELEC units
1/2" NPT	FM / CSA units

### Dimensions (approximate) in mm



### Weights (approximate) in kg

DP transmitter	3-way manifold	M640 assembly
6.5	1	7.5

### Technical data

<b>Range</b>	Minimum 0 - 10 inches H <sub>2</sub> O (24.9 mbar)
	Maximum 0 - 450 inches H <sub>2</sub> O (1122 mbar)
<b>Output</b>	4 - 20 mA dc (2 wire)
	Maximum loop impedance 600 Ω with 24 Vdc supply
<b>Power supply</b>	10 V to 42 Vdc
<b>Pressure limits</b>	0 to 74 bar g (saturated steam)
<b>Temperature limits</b>	-40°C to +85°C (electronics)
	0°C to +125°C (diaphragm)
<b>Accuracy</b>	± 0.1% of calibrated span to include the effects of linearity, hysteresis and repeatability
<b>Enclosure rating</b>	NEMA 4X/6P (IEC IP66/IP68)

### Materials

<b>Enclosure</b>	Aluminium
<b>Body</b>	316 Stainless steel
<b>Diaphragm</b>	Hastelloy C
<b>3-way manifold</b>	Carbon steel (zinc plated)
<b>Fluid fill</b>	Silicone oil

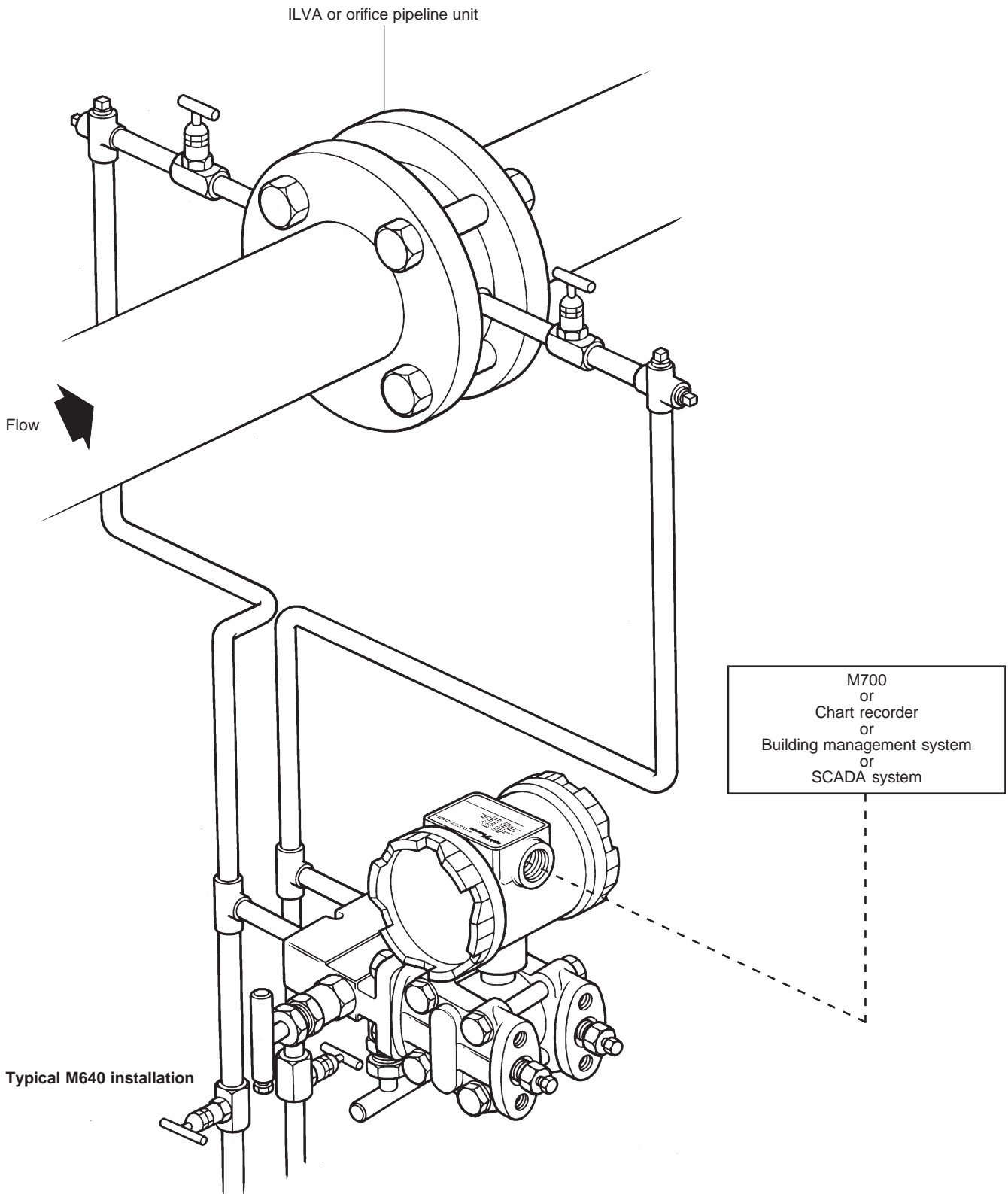
### Safety information, installation and maintenance

**Warning:** This document does not give sufficient information for safe installation of the product. Full details are given in the Installation and Maintenance Instructions that accompanies the M640.

### How to order

**Example:** 1 off Spirax Sarco M640 steam mass flow transmitter configured for use with a DN80 ILVA flowmeter passing 2 000 kg/h of saturated steam at 7 bar g.

## Typical installation



The following information will allow us to uniquely configure the M640 for each application prior to despatch.

Parameter	Range of values	Customer requirements	Notes
Flowmeter type	Gilflo or orifice plate		Specify flowmeter type
Gilflo serial number	-		Required for existing flowmeters only
Analogue output units	kg/h, lb/h, Btu or kJ/h		Specify required units
Analogue output scaling (4 mA)	kg/h, lb/h, Btu or kJ/h		Normally zero
Analogue output scaling (20 mA)	kg/h, lb/h, Btu or kJ/h		Normally maximum required flowrate
Maximum range $\Delta p$	10 in. to 450 in. H <sub>2</sub> O (24.9 to 1122 mbar)		From Gilflo or orifice plate sizing sheet
Steam quality (dryness fraction)	0.7 to 1.0		Set at 1 unless otherwise specified