

# Intelligent Digital® (CAN-open) sensors and accessories for use with HPM Series meters and in generic CAN bus environments

All Intelligent Digital® (ID) sensors use the CAN-open protocol that makes a plug-and-play system with the HPM meters. These sensors are compliant with the CAN-open standard and are fully supported for integration in third party systems.

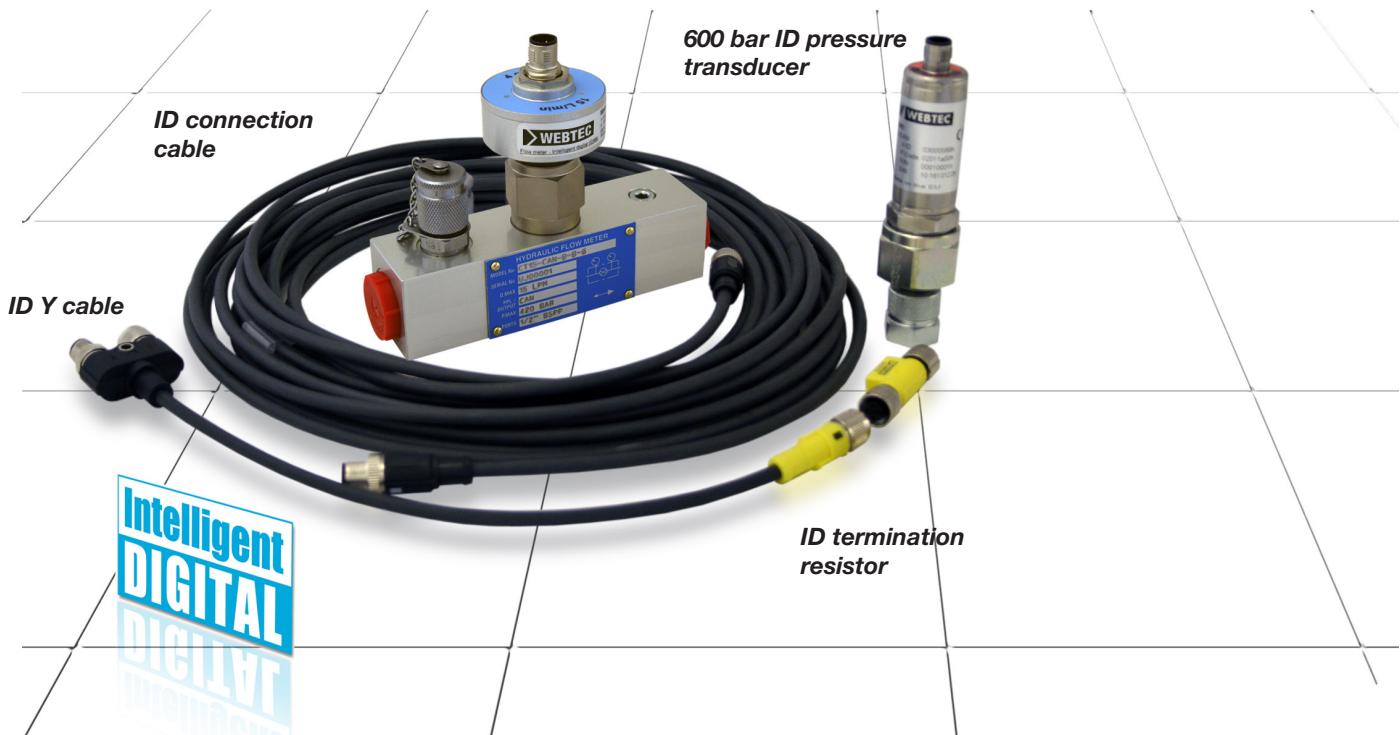
There is a wide range of cables and connectors to suit all applications. The ID sensors are connected in-line with one another, by way of a Y cable, often resulting in shorter cable lengths.

The CT and CTR series of turbine flow meters, provide a complete solution to the flow and temperature measurement of hydraulic systems on test stands, machine tools and other fixed or mobile applications. The flow meter can be installed anywhere in the hydraulic circuit for production testing, commissioning, development testing and control systems. The compact design allows the flow meters to be installed where space is limited.

The integral loading valve built into the CTR series provides smooth progressive pressure control in both flow directions allowing components such as cylinders or motors to be tested without re-plumbing the test connections.

## Features

- BI directional flowmeters operation.
- Flowmeters with loading valve have Interpass® safety protection system, bypasses oil internally in the event of the valve being over pressurised in either flow direction.
- Flowmeter temperature range of -20 to 90 °C, -4 to 194 °F.
- Pressure transducer temperature range of -25 to 105 °C, -13 to 221 °F.
- Pressure transducer housed in a stainless-steel body and are available in ranges up to 1000 bar, 14500 psi.



## Flowmeters Specifications

<b>Maximum Rated Pressure:</b>	480 bar, 7000 psi
<b>Maximum Flow:</b>	1500 L/min, 400 US gpm
<b>Ambient Temperature Range:</b>	-10 to 50 °C, 14 to 122 °F
<b>Fluid Temperature Range:</b>	-20 to 90 °C, -4 to 194 °F continuous use
<b>Temperature display:</b>	-25 to +125 °C (-13 to +257 °F).
<b>Viscosity range:</b>	10...100 cSt
<b>Compatible Fluid:</b>	Mineral oils to ISO 11158. Other fluids consult sales office.
<b>Accuracy/Tolerances:</b>	Reading 15% to 100% of flow range - 1% of indicated reading. Readings below 15% of full scale flow - fixed accuracy of 0.15% of full scale (CT15 is 1% of full scale).
<b>Temperature:</b>	Temperature $\pm$ 2 °C
<b>Repeatability:</b>	Better than $\pm$ 0.2%
<b>Filtration:</b>	Oil cleanliness should be better than DIN ISO4406: 21/19/16 or NAS 10 (typically achieved with 20-20u filters).
<b>CT15:</b>	CT15; should be better than DIN ISO4406: 19/16/13 or NAS 7 (typically achieved with 10u filters or less).
<b>Porting:</b>	BSPP, SAE
<b>Material:</b>	
<b>Flow Body:</b>	600/750 High tensile Aluminium 2014A T6 60/150/300/400 High tensile Aluminium 2011 T6 15 High tensile Aluminium 6082 T6
<b>Internal Materials:</b>	Aluminium, Steel, Stainless Steel.
<b>Transducer:</b>	Body and nut - steel 212A42 electroless nickel plated Housing and Lid - Aluminium 2011 T3 electroless nickel plated
<b>Seal:</b>	FKM (EPDM seals - CT models only. Consult sales office).
<b>IP Rating:</b>	IP66 (EN60529) *With cable connected
<b>Power Supply:</b>	8-40 V d.c
<b>Response Time:</b>	50 ms

## Sales Order Code

Please contact our technical sales team to discuss any special order requirements.

### Flowmeters Model Number Table

MODEL NUMBER	MAIN PORTS	TOP PORTS	FLOW RANGE	MAX. PRESSURE
CT15-CAN-B-B-6	1/2" BSPP	1/4" BSPP	1 - 15 L/min	420 bar
CT15-CAN-S-S-6	3/4" -16UN #8 SAE ORB	7/16" -20UN #4 SAE ORB	0.25 - 4 US gpm	6000 psi
CT60-CAN-B-B-6	3/4" BSPP	1/4" BSPP	3 - 60 L/min	420 bar
CT60-CAN-S-S-6	1-1/16" -12UN #12 SAE ORB	7/16" -20UN #4 SAE ORB	0.8 - 16 US gpm	6000 psi
CT150-CAN-B-B-6	3/4" BSPP	1/4" BSPP	5 - 150 L/min	420 bar
CT150-CAN-S-S-6	1-1/16" -12UN #12 SAE ORB	7/16" -20UN #4 SAE ORB	1.3 - 40 US gpm	6000 psi
CT300-CAN-B-B-6	1" BSPP	1/4" BSPP	8 - 300 L/min	420 bar
CT300-CAN-S-S-6	1-5/16" -12UN #16 SAE ORB	7/16" -20UN #4 SAE ORB	2 - 80 US gpm	6000 psi
CT600-CAN-B-B-5	1-1/4" BSPP	1/4" BSPP	15 - 600 L/min	350 bar
CT600-CAN-S-S-5	1-5/8" -12UN #20 SAE ORB	7/16" -20UN #4 SAE ORB	4 - 160 US gpm	5000 psi
CT750-CAN-S-B-7	1-7/8" -12UN #24 SAE ORB	1/4" BSPP	20 - 750 L/min	480 bar
CT750-CAN-S-S-7	1-7/8" -12UN #24 SAE ORB	7/16" -20UN #4 SAE ORB	5 - 200 US gpm	7000 psi
CT1500-CAN-F-S-6-L	2" #32 SAE Code 62 4-bolt flange	7/16" -20UN #4 SAE ORB	50 - 1500 L/min	420 bar
CT1500-CAN-F-S-6	2" #32 SAE Code 62 4-bolt flange	7/16" -20UN #4 SAE ORB	12.5 - 400 US gpm	6000 psi

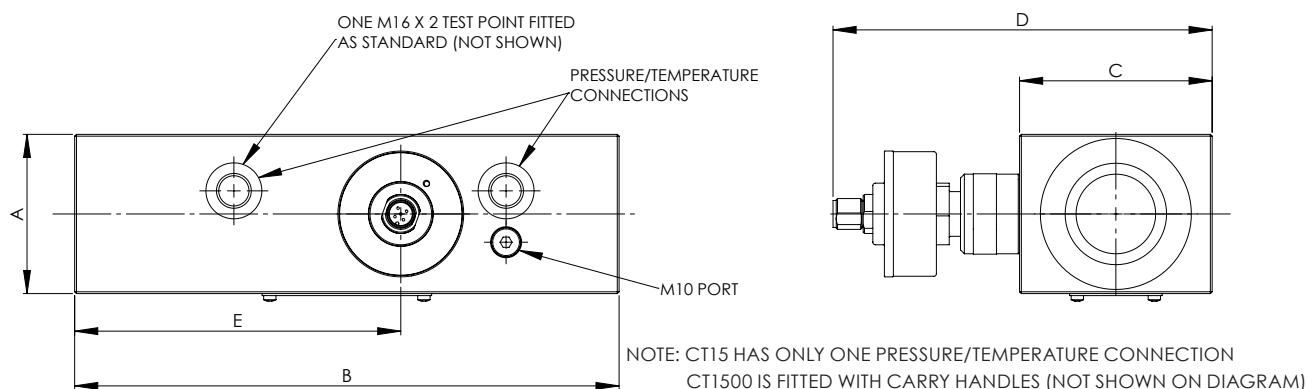
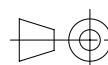
Note: To order please quote the model number from the table above

## Installation Details

### Flowmeters Dimension Table

MODEL NUMBER	A		B		C		D		E		WEIGHT	
Units	mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
CT15	37	1-1/2	136	5-3/8	37	1-1/2	123	5	69.5	2-3/4	0.7	1.5
CT60	62	2-1/2	190	7-1/2	50	2	136	5-3/8	103	4	1.6	3.5
CT150	62	2-1/2	190	7-1/2	50	2	136	5-3/8	103	4	1.6	3.5
CT300	62	2-1/2	190	7-1/2	50	2	140	5-1/2	103	4	1.7	3.7
CT600	62	2-1/2	212	8-3/8	75	3	152	6	127	5	2.7	6
CT750	100	4	212	8-3/8	75	3	160	6-1/4	126	5	5	11
CT1500	140	5-1/2	260	10-1/4	100	4	176*	7*	130	5-1/8	10	22

\*CT1500 includes 4 feet on base, add 20mm, 3/4" to D for full height



## Sales Order Code

Please contact our technical sales team to discuss any special order requirements.

### Flowmeters with Loading Valve Model Number Table

MODEL NUMBER	MAIN PORTS	TOP PORTS	FLOW RANGE	MAX. PRESSURE
CT300R-CAN-B-B-6	1" BSPP	1/4" BSPP	8 - 300 L/min	420 bar
CT300R-CAN-S-S-6	1-5/16" -12UN #16 SAE ORB	7/16" -20UN #4 SAE ORB	2 - 80 US gpm	6000 psi
CT750R-CAN-S-B-7	1-7/8" -12UN #24 SAE ORB	1/4" BSPP	20 - 750 L/min	480 bar
CT750R-CAN-S-S-7	1-7/8" -12UN #24 SAE ORB	7/16" -20UN #4 SAE ORB	5 - 200 US gpm	7000 psi

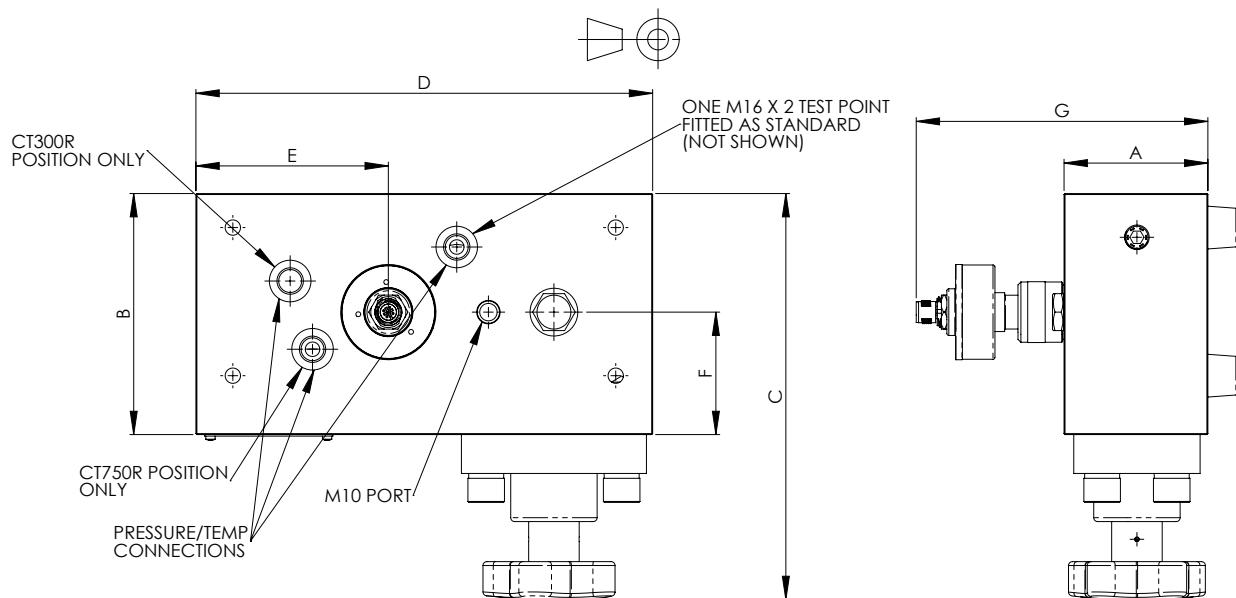
Note: To order please quote the model number from the table above

## Installation Details

### Flowmeters with Loading Valve Dimension Table

MODEL NUMBER	A		B		C		D		E		F		G		WEIGHT	
Units	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
CT300R	49	2	100	4	182	7-1/8	222	8-3/4	102.5	4	47.6	1-7/8	138	5-1/2	3.7	8.1
CT750R	75	3	125	5	211	8-3/8	235	9-3/4	99	3-7/8	63	2-1/2	157	6-1/8	7.5	16.5

Add 20mm (3/4") to G for full height including feet



## Pressure Transducer Specifications

<b>Maximum Rated Pressure:</b>	1000 bar, 14,500 psi
<b>Ambient Temperature Range:</b>	-25 to 85 °C, -13 to 185 °F
<b>Fluid Temperature Range:</b>	-25 to 105 °C, -13 to 221 °F continuous use
<b>Compatible Fluid:</b>	Hydraulic Mineral oils, Other fluids consult sales office
<b>Accuracy/Tolerances:</b>	
<b>Pressure:</b>	± 0.5% full scale
<b>Temperature:</b>	± 3 °C, 5.4 °F (SR-PTT-* ONLY)
<b>Porting:</b>	Supplied with M16 x 2 test point connector rated to a maximum pressure of 630 bar, 9100 psi and a 'live' connection pressure of 400 bar, 5800 psi or less.
<b>Material:</b>	
<b>Body Materials:</b>	Stainless steel 1.4301
<b>Seal:</b>	FKM
<b>Cable:</b>	Cable Jacket - Polyurethane Nut - Chrome plated Zinc Contact - Brass
<b>Weight:</b>	170 g, 0.4 lb
<b>IP Rating:</b>	IP66 (EN60529) *With cable connected
<b>Power Supply:</b>	8-40 V d.c
<b>Response Time:</b>	1 ms

## Sales Order Code

Please contact our technical sales team to discuss any special order requirements.

### CAN (ID) Pressure Transducers Model Number Table

MODEL NUMBER	PRESSURE RANGE BAR	OVERLOAD PRESSURE P <sub>MAX</sub> BAR
SR-PT*-016-05-0C-CAN	-1 - 16	32
SR-PT*-060-05-0C-CAN	0 - 60	120
SR-PT*-160-05-0C-CAN	0 - 160	320
SR-PT*-400-05-0C-CAN	0 - 400	800
SR-PT*-600-05-0C-CAN	0 - 600	1000
SR-PT*-1K0-05-0C-CAN	0 - 1000	1000**

Note: To order please quote the model number from the table above.

Replace \* with 'N' for no temperature and with 'T' for unit with temperature.

\*\*When using the 1000 bar sensor above 630 bar we recommend the M16 x 2 test point adapter is not used - connect the sensor directly.

## CAN (ID) Connection Cables

MODEL NUMBER	LENGTH
SR-CBL-0.5-MF-CAN	0.5 m
SR-CBL-02-MF-CAN	2 m
SR-CBL-05-MF-CAN	5 m
SR-CBL-10-MF-CAN	10 m
SR-CBL-0.05-Y-CAN	Splitter no cable
SR-CBL-0.3-Y-CAN	CAN Y splitter, including 0.3 m cable
SR-CBL-000-R-CAN	CAN terminating resistor
SR-CONN-ADPT-M12	Cable adapter M12x1 5pol analog

## Accessories/Spares

MODEL NUMBER	DESCRIPTION
SR-USB-HPM6000	USB cable type A to B
SR-HPM-CHG-03-0C	In car charger adaptor
HPM7000-AC-CHG	In car charger adaptor 12 V HPM7000
HPM7000-AC-PSU	Power supply HPM7000

## Other sensors &amp; accessories

MODEL NUMBER	DESCRIPTION
SR-VADC-710	SR/CAN voltage, current & frequency converter
SR-TTP-190-05-0C-CAN	CAN Temperature transducer -40 to 150 °C 1/4" BSPP
SR-ICM	ICM Contamination Monitor Kit for HPM7000

## Installation Details Dimensions in mm [Inches]



## CAN-open Functionality

All the CAN sensors listed above are CAN-open compliant and can be used by integrators in CAN bus applications. The sensors digitise the physical quantity and make the value available on the CAN bus. They can sample at various rates, apply filtering and scale the measurements appropriately.

The sensors implement the CAN2.0B standard and can transmit at rates up to 1Mbit/s with 11 or 29 bit identifiers. The physical layer of the 2-wire interface is specified according to ISO 11898. The bus termination resistor is not included in the device.

The CAN protocol complies with the CAN-open specification DS301 and CAN-open device profile DS404. Possible configurations can be set with the object dictionary. Heartbeat and emergency messages can be used to monitor the status of the sensor.

## CAN Supply

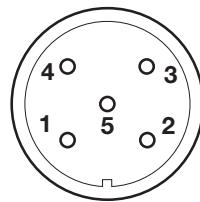
**Voltage:** 8-40 V d.c, protected against reverse polarity  
**Current:** Pressure, temperature <10 mA  
 Flow 25 mA

## CAN Interface

**Physical layer:** 2-wire interface, 5 V level according to ISO 11898, protected against short-circuit  
**Max. Bitrate:** 1 Mbit/sec  
**Bus termination:** External (120 Ω) at last node  
**Protocol:** CAN-open DS301, Device Profile DS404

## Connecting Details

	ASSIGNMENT
1	CAN shield, PE
2	+ UB, +24 V d.c
3	GND, 0V
4	CAN_H, CAN+
5	CAN_L, CAN-



## CAN-Open Summary

The measured data can be extracted from the sensor in one of two formats: process value or field value.

Process value is a 32 bit floating point number (little endian) to IEEE-754-Format. It is formatted and scaled in the appropriate sensor units, ie. bar, lpm, usgpm, etc.

Field value is a 16 bit integer ( $\pm 32000$ ) representing the linear gradient of the sensor value. This must be converted to a process value based on the sensor type and range by the user. It has the advantage of producing less bus traffic but must be configured at every power up.

**CAN-open type:** NMT Slave

**Network boot up:** Minimum boot up

**COB-ID placing:** Pre-defined connection set, SDO

**Node id:** Object (specific entry)

**Bitrate:** Object (specific entry)

**Number of PDOs:** PDO1, PDO5, PDO6 & PDO7

**Emergency message:** Supported

**Heartbeat:** Supported

**Device profile:** CiA DS404

**Default settings:** Bitrate 500 kbit/s

Node ID 78 hex (may vary)

Process value automatically transmits at the set rate after power on.

Full data sheets are available on request from Webtec sales.

Electronic Data Sheets (EDS) created with the CAN-open Design Tool v2.2.42.0. are also available.