

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

Up to

- 750 lpm, 200 US gpm flow measurement
- 1000 bar, 14500 psi pressure measurement

## Wide range of cables and accessories

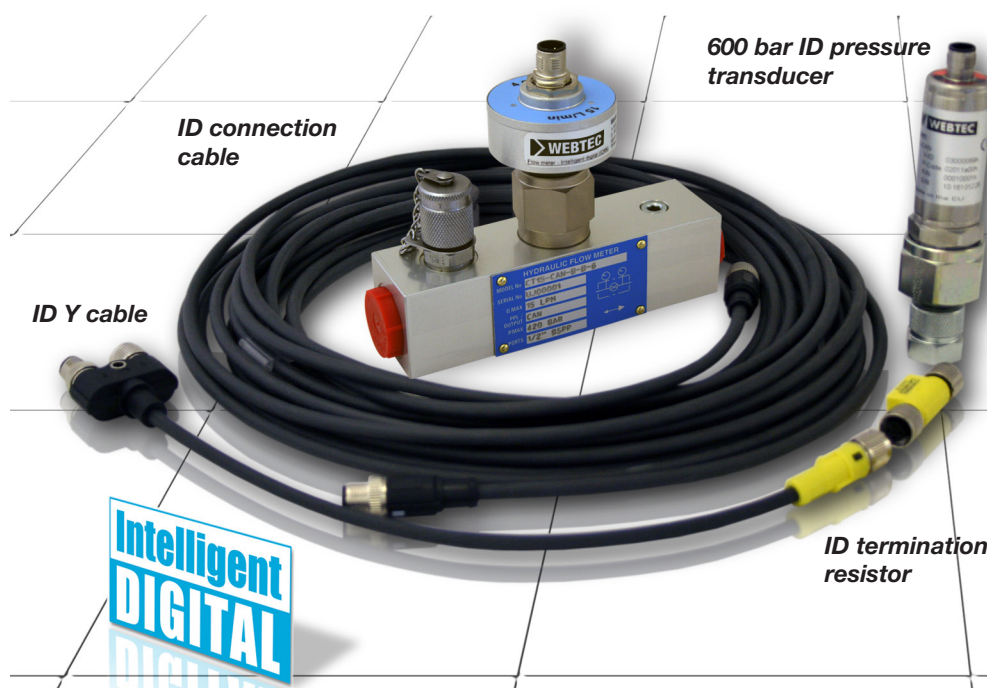
All Intelligent Digital (ID) sensors use the CAN-open protocol that makes a plug-and-play system with the HPM meters. These sensors are compliant with the CAN-open standard and are fully supported for integration in third party systems. The SR sensors are also plug-and-play, are compatible with the current range of HPM meters and backwards compatible with previous meters.

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.

The pressure sensors are available in six different ranges up to 1000 bar and all measure temperature as well. The whole unit is housed in a stainless steel body, sealed to IP67.



## Hydraulic measurement and control

hidra[matic]

Downloaded from: [www.hidramatic.com](http://www.hidramatic.com)

### Features

#### Flowmeters

- **FLOW:** – 1 -750 lpm  
0.25 - 200 US gpm
- **PRESSURE:** Upto  
480 bar, 7000 psi
- **PORTING:** BSPP or SAE  
BI directional operation

#### Flowmeters with Loading Valve

- **FLOW:** – 1 -750 lpm  
0.25 - 200 US gpm
- **PRESSURE:** Upto  
480 bar, 7000 psi
- **PORTING:** BSPP or SAE
- **BI DIRECTIONAL**  
operation 'INTERPASS™'  
safety system, bypasses  
oil internally in the event  
of valve being over  
pressurised
- **FLOWMETER**  
**TEMPERATURE:**  
-25 to 125°C (-13 to 257 °F)

#### Pressure transducers

- **PRESSURE:** -1 to 1000 bar  
(-14.5 to 14500 psi)
- **TEMPERATURE:** -25 to  
105 °C (-13 - 221 °F)

#### Accessories

- **CABLES:** 0.5 to 20 meter  
long

## Flowmeters

### Specifications

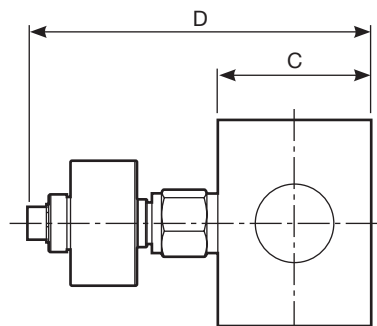
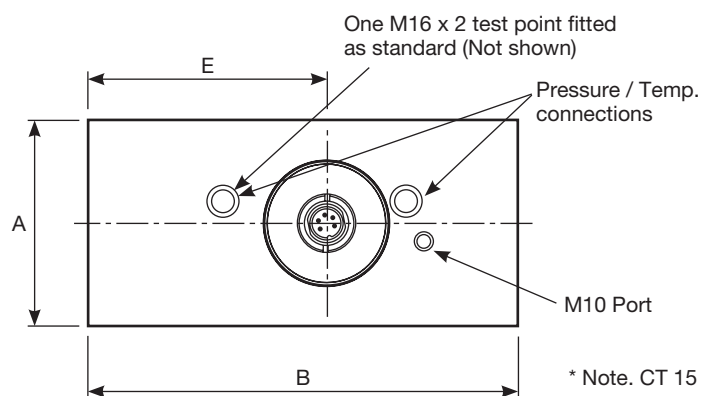
Model Number	Main ports	Top ports*	Flow range	Max. pressure
CT15-***-B-B-6	1/2" BSPP	1/4" BSPP	1 - 15 lpm	420 bar
CT15-***-S-S-6	3/4" -16UN #8 SAE ORB	7/16" -20UN #4 SAE ORB	0.25 - 4 US gpm	6000 psi
CT60-***-B-B-6	3/4" BSPP	1/4" BSPP	3 - 60 lpm	420 bar
CT60-***-S-S-6	1-1/16" -12UN #12 SAE ORB	7/16" -20UN #4 SAE ORB	0.8 - 16 US gpm	6000 psi
CT150-***-B-B-6	3/4" BSPP	1/4" BSPP	5 - 150 lpm	420 bar
CT150-***-S-S-6	1-1/16" -12UN #12 SAE ORB	7/16" -20UN #4 SAE ORB	1.3 - 40 US gpm	6000 psi
CT300-***-B-B-6	1" BSPP	1/4" BSPP	8 - 300 lpm	420 bar
CT300-***-S-S-6	1-5/16" -12UN #16 SAE ORB	7/16" -20UN #4 SAE ORB	2 - 80 US gpm	6000 psi
CT600-***-B-B-5	1-1/4" BSPP	1/4" BSPP	15 - 600 lpm	350 bar
CT600-***-S-S-5	1-5/8" -12UN #20 SAE ORB	7/16" -20UN #4 SAE ORB	4 - 160 US gpm	5000 psi
CT750-***-S-B-7	1-7/8" -12UN #24 SAE ORB	1/4" BSPP	20 - 750 lpm	480 bar
CT750-***-S-S-7	1-7/8" -12UN #24 SAE ORB	7/16" -20UN #4 SAE ORB	5 - 200 US gpm	7000 psi
CT750-SR-F-B-3 SR	1-1/2" #24 SAE Code 61 4-bolt flange	1/4" BSPP	20 - 750 lpm	210 bar
CT750-SR-F-S-3 SR	1-1/2" #24 SAE Code 61 4-bolt flange	7/16" -20UN #4 SAE ORB	5 - 200 US gpm	3000 psi

Replace \*\*\* with CAN or SR to give complete model number. \*CT 15 has one of the specified top ports.

Dimensions in mm (inches)

Model Number	A	B	C	D	E	Weight kg (lbs)
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)
CT400	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")	156 (6")	127 (5")	2.7 (6)
CT600-**-F-**-*	100 (4")	212 (8-3/8")	75 (3")	160 (6-1/4")	126 (5")	5.0 (11)
CT750	100 (4")	212 (8-3/8")	75 (3")	160 (6-1/4")	126 (5")	5.0 (11)

SR version is 9mm (3/8") shorter on the D dimensions



\* Note. CT 15 has also one Pressure / Temp connection

## Flowmeters with loading valve

### Specifications

Model Number	Main ports	Top ports	Flow range	Max. pressure
CT300R-***-B-B-6	1" BSPP	1/4" BSPP	8 - 300 lpm	420 bar
CT300R-***-S-S-6	1-5/16" -12UN #16 SAE ORB	7/16" -20UN #4 SAE ORB	2 - 80 US gpm	6000 psi
CT600R-SR-F-B-3	1-1/2" #24 SAE Code 61 4-bolt flange	1/4" BSPP	20 - 600 lpm	210 bar
CT600R-SR-F-S-3	1-1/2" #24 SAE Code 61 4-bolt flange	7/16" -20UN #4 SAE ORB	5 - 160 US gpm	3000 psi
CT600R-SR-S-B-7	1-7/8" -12UN #24 SAE ORB	1/4" BSPP	20 - 600 lpm	480 bar
CT600R-SR-S-S-7	1-7/8" -12UN #24 SAE ORB	7/16" -20UN #4 SAE ORB	5 - 160 US gpm	7000 psi
CT750R-***-S-B-7	1-7/8" -12UN #24 SAE ORB	1/4" BSPP	20 - 750 lpm	480 bar
CT750R-***-S-S-7	1-7/8" -12UN #24 SAE ORB	7/16" -20UN #4 SAE ORB	5 - 200 US gpm	7000 psi
CT750R-SR-F-B-3	1-1/2" #24 SAE Code 61 4-bolt flange	1/4" BSPP	20 - 750 lpm	210 bar
CT750R-SR-F-S-3	1-1/2" #24 SAE Code 61 4-bolt flange	7/16" -20UN #4 SAE ORB	5 - 200 US gpm	3000 psi

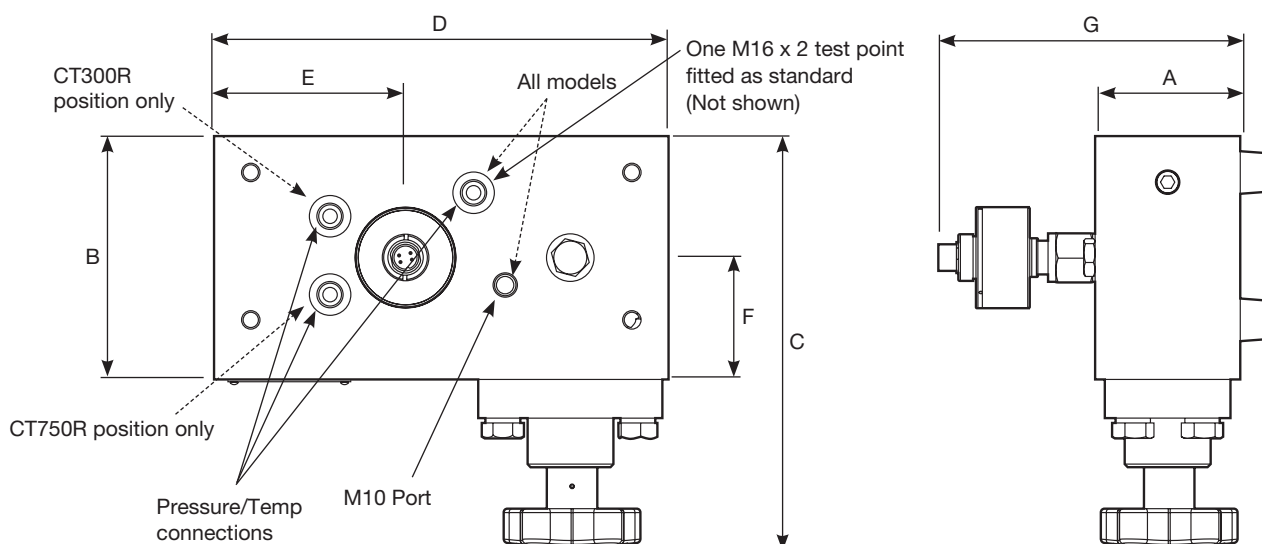
Replace \*\*\* with CAN or SR to give complete model number.

Dimensions in mm (inches)

Model No	A	B	C	D	E	F	G	Weight kg (lbs)
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)
CT400R	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)
CT600R	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)
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.

SR version is 9mm (3/8") shorter on the G dimensions



### Functional specification

#### CT and CTR flow meters

##### Ambient temperature:

-10 to 50 °C (14 - 122 °F)

##### Fluid type:

Oils, fuels, water glycol, water oil emulsions

##### Fluid temperature:

-20 to 90 °C (-4 - 194 °F) continuous use.

##### Filtration

25 µm (10 µm for CT15-CAN)

##### Viscosity range

10...100 cSt

##### Temperature display:

-25 to +125 °C (-13 to +257 °F). NB. CAN flow transducers only.

##### Accuracy:

15 to 100% of range - 1% of indicated reading  
Below 15% fixed accuracy of 1% of 15% of full scale (CT15 is 1% of full scale)  
Temperature ± 2 °C (CAN only).

##### Repeatability:

Better than ± 0.2%

##### Degree of protection\*:

CT-SR - IP54 (EN60529)  
CT-CAN - IP66 (EN60529) \*With cable connected

### Electrical specification

#### Power supply:

CAN: 8 - 40 VDC, SR: 7-15 VDC

#### Response Time:

50 ms

### Construction material

#### Flow body:

600/750 High tensile Aluminium 2014A T6  
15/60/150/300/400 High tensile Aluminium 2011 T6  
Aluminium, Steel, Stainless Steel.

#### Internal parts:

#### Transducer:

Body and nut - steel 212A42 electroless nickel plated, Housing and Lid - Aluminium 2011 T3

#### Seals:

Viton seals as standard EPDM are available - please consult sales office.

## Pressure Transducers

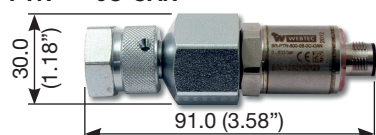
### CAN (ID)

Model Number	Pressure range	Overload pressure Pmax
SR-PT*-016-05-0C-CAN	-1 - 16 bar	32 bar
SR-PT*-060-05-0C-CAN	0 - 60 bar	120 bar
SR-PT*-160-05-0C-CAN	0 - 160 bar	320 bar
SR-PT*-400-05-0C-CAN	0 - 400 bar	800 bar
SR-PT*-600-05-0C-CAN	0 - 600 bar	1000 bar
SR-PT*-1K0-05-0C-CAN	0 - 1000 bar	1000 bar <sup>*See Note</sup>

Replace \* with 'N' for no temperature and with 'T' for unit with temperature. Supplied with M16 x 2 test point connector rated to a maximum pressure of 630 bar and a 'live' connection pressure of 400 bar or less.

Note. When using the 1000 bar sensor above 630 bar we recommend the M16x2 test point adapter is not used - connect the sensor directly.

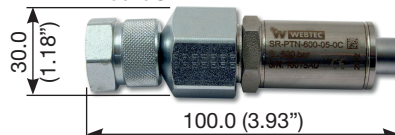
#### SR-PTN-\*\*\*-0C-CAN



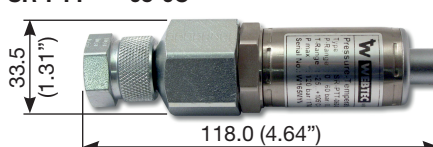
#### SR-PTT-\*\*\*-0C-CAN



#### SR-PTN-\*\*\*-05-0C



#### SR-PTT-\*\*\*-05-0C



### Functional specification

#### Ambient temperature:

-25 to 85 °C (-13 - 185 °F)

#### Fluid type:

Oils, fuels, water glycol, water oil emulsions

#### Fluid temperature:

-25 to 105 °C (-13 - 221 °F)

#### Accuracy:

Pressure: ± 0.5% full scale

Temperature: ± 3 °C (SR-PTT-\* ONLY)

### Electrical specification

#### Power supply:

CAN: 8 - 40 VDC SR: 7-15 VDC SR

#### Response Time:

1 ms

### Construction material

#### Main body:

Stainless steel 1.4301

#### Sealing:

Viton® (FKM)

#### Degree of protection\*:

SR - IP54 (EN60529)

CAN - IP66 (EN60529) \*With cable connected

#### Wetted parts:

Stainless steel 1.4301, Viton® (FKM)

#### Dimensions:

95.6 mm x 26.9 mm

#### Weight approx.:

170 g

### CAN (ID) Connection cables

Model Number	Length
SR-CBL-0.5-MF-CAN	0.5m
SR-CBL-02-MF-CAN	2m
SR-CBL-05-MF-CAN	5m
SR-CBL-10-MF-CAN	10m
SR-CBL-20-MF-CAN	20m
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-M8	Cable adapter M8x1 4pol Digital IN/OUT
SR-CONN-ADPT-M12	Cable adapter M12x1 5pol analog

### Accessories / spares

Model Number	Description
SR-PSU-HPM6000	HPM6000 power pack
SR-HPM6000-00-0C-STP	HPM6000 neck strap
SR-CAB-540-PC-USB	HPM540 PC Cable to USB
SR-USB-HPM6000	USB cable type A to B
SR-LAN-HPM6000	LAN cable
SR-HPM-PSU-MC-1C	Power supply for HPM540
SR-HPM-CHG-03-0C	In car charger adaptor
SR-HAND-HPM6000	Replacement handle for HPM6000

### SR

Model Number	Pressure range	Overload pressure Pmax
SR-PT*-015-05-0C	-1 - 15 bar	32 bar
SR-PT*-060-05-0C	0 - 60 bar	120 bar
SR-PT*-150-05-0C	0 - 150 bar	320 bar
SR-PT*-400-05-0C	0 - 400 bar	800 bar
SR-PT*-600-05-0C	0 - 600 bar	1000 bar
SR-PT*-1K0-05-0C	0 - 1000 bar	1000 bar <sup>*See Note</sup>

### SR Cables

Model Number	Length	Type
SR-CBL-003-55-MM	3m	Connecting
SR-CBL-005-55-MM	5m	Extension
SR-CBL-002-54-MM	2m	Adaptor 5 to 4 pin

### Other sensors & accessories

Model Number	Description
SR-RPM-300-05-3C	SR Tach with 5 pin fixed cable
SR-RPM-WHL-00-0C	Tach contact wheel
SR-RPM-ADP-00-0C	Focus adaptor
SR-EXT-TRG-05-1C	External trigger box
SR-VADC-700	SR/CAN voltage, current & frequency converter
SR-FQC	SR frequency converter
SR-TTP-190-05-0C	SR Temperature transducer -40 to 150 °C 1/4" BSPP
SR-TTP-190-05-0C-CAN	CAN Temperature transducer -40 to 150 °C 1/4" BSPP
SR-ICM*	ICM Contamination Monitor Kit for HPM6000

\* Only NAS code is transmitted to the HPM6000 as standard.  
Other options available - please consult sales office.

## 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 1Mbits/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 specification

#### Supply

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

#### CAN Interface

**Physical layer:** 2-wire interface, 5 V level according to ISO 11898, protected against short-circuit

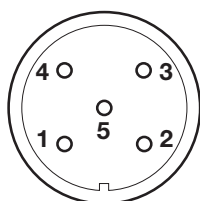
**max. Bitrate:** 1 Mbit/sec

**Bus termination:** external (120Ω) at last node

**Protocol:** CAN-open DS301, Device Profile DS404

### Connections

	Assignment
1	CAN shield, PE
2	+ UB, +24 VDC
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 32bit 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 16bit integer (±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 bootup:** minimum bootup  
**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  
 NodeID 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.



APPROVED

Webtec reserve the right to make improvements and changes to the specification without notice