

## Manoswitch

### Item numbers covered by his datasheet

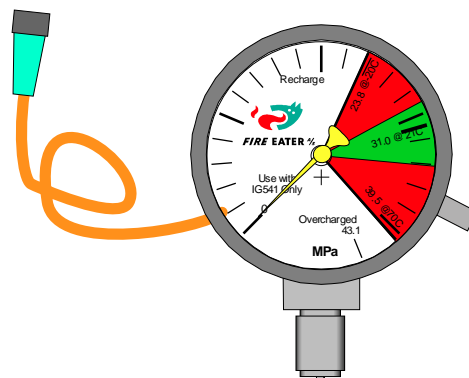
305373	ManoSw 28.4MPa sp16.6 UL2127
305374	ManoSw 43.1MPa sp24.9 UL2127
305360	ManoSw 0-160bar sp50 EN12094
305368	ManoSw 250bar sp122
305376	ManoSw 43.1MPa sp 22.5

### Variants and early style

Variants (Not all are available)

- 8 Customer specified
- 23 EAC (former GOST)
- 31 IEC331 cable
- 131 CCCF dial

305370	Manoswitch 0-250 bar sp 166 EN12094
305375	Manoswitch 0-400 bar sp 249 EN12094
303013	ManoSw 0-250bar sp 150 conn
303014	ManoSw 0-250bar sp 166 conn
303017	ManoSw 0-400bar sp 225 conn
303018	ManoSw 0-400bar sp 249 conn
305375-23	ManoSw 0-40MPa sp249 GOST-R



## General

Manoswitch is a combined pressure gauge and pressure switch used in Fire Eater Control Inert (Ci) system.

The pressure gauge is typically supplied with the IV8 valve.

The manoswitch features a change over switch allowing for indication of normal and low pressure.

Several switches can be connected in a daisy-chain with an end of line resistor at the last switch. In this way a full monitoring of all switches is possible in a nice and simple way, eliminating the risk of having short circuits or broken lines not being indicated as a fault.

If the pressure on one of the manoswitches falls, the whole circuitry will indicate low pressure.

Only two wires brown + black are needed for connection to the control panel.

Standardized units used is either Bar or MPa.

In Europe, bar is the widely used unit for pressure, and Pa (KPa or MPa at higher pressures) is the Si unit.

To convert from bar to MPa you have to divide by a factor of 10. 400 bar = 40MPa.

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Control inert

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**FIRE EATER %**

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Text

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**Specifications**

Size:	ø63 mm	
Pressure		
Work:	as Dial	
Range (dial):	See table 1 & 2	
Switch (falling):	See table 1 & 2	
Switch (rising):	1.1× falling pressure	
Proof (burst):	> 1100 bar	
Accuracy		
Pressure gauge:	Class 1.6 (1.6% of fullscale)	
Pressure switch:	Class 2.5 (2.5% of fullscale)	
Temperature:	-40 to +80°C	
Water ingress:	IP67	
Thread connections:	1/4", EN837 table 9 type 10 (vertical downward connection)	
Smallest container:	2l (200 or 300 bar @ 15°C)	
Leakage:	< 5×10 <sup>-5</sup> mbar l /s	
Materials:		
Housing	Stainless steel	
Wetted parts	Stainless steel	
Lens	Tempered glass	
Dimension:		
H×W:	110×ø65mm	
Weight:	0.5 kg	
Switch rating:	0.1A 30 Vac/DC	
Cable:	400mm, orange, IEC 332-1	
Connections:		
Right side:	Cable w. M8×1 female plug (industrial standard)	
Left side:	M8×1 male plug (industrial standard)	
Electrical:	See diagram	
Cable colour codes:		
Brown:	Pin 1	Straight through from female to male connector
Blue:	Pin 3	Through + connected to NC (at low/no pressure)
Black:	Pin 4	Only through switch

**Markings**

On back of pressure gauge  
 Fire Eater Logo, Ci-MANSW, "Dial", Serial number, CE1116, 14

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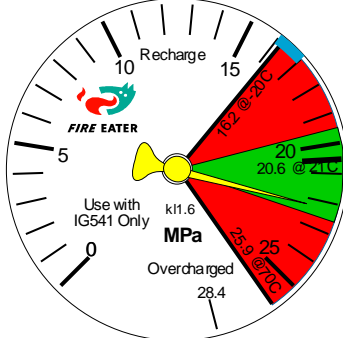
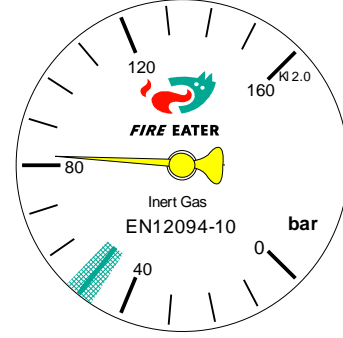
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Table 1

These are the gauges currently used on standard component like Ci IV8 and PDS systems

Item number	Text	Switch Falling / Rising	Dial
305373	28.4MPa sp16.6 UL2127	16.6 ± 0.6 MPa <18.8 MPa	
305374	43.1MPa sp24.9 UL2127	24.9 ± 0.9 MPa <28.2 MPa	
305360	0-160 bar sp50 EN12094	5.0 ± 0.6 MPa <7 MPa	

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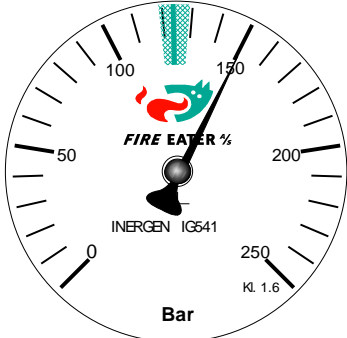
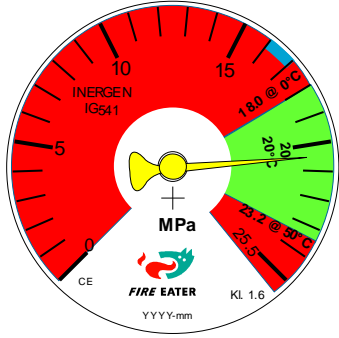
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Table 2

These are standard variants (2017)

Item number	Text	Switch Falling / Rising	Dial
305368	250bar sp122	12.2 ± 0.6 MPa <14 MPa	
	250bar sp 122 EN12094-10 Compliant and certified Change over switch Used for 150bar systems and low temperature 200bar systems		
305373-131	25MPa sp16.6		
	CCCF variant of 305373		
305376	43.1MPa sp22.5	22.5 ± 0.9 MPa <28.2 MPa	
	Variant of 305374 with lower switch point		

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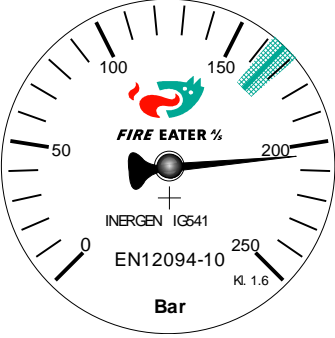
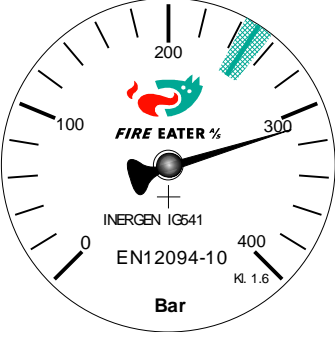
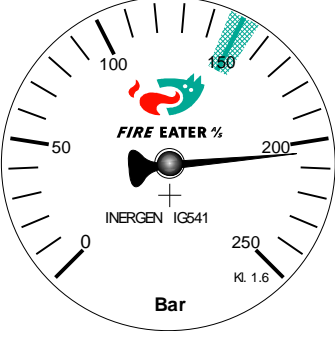
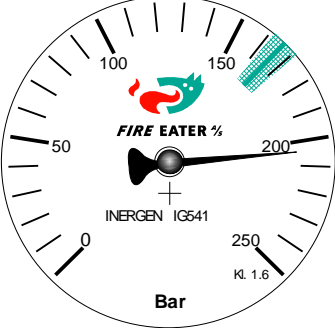
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Table 3

These are the earlier gauge dials only available as replacements gauges or special markets/applications.

Item number	Text	Switch Falling / Rising	Dial
305370	0-250 bar sp 166 EN12094	16.6 ± 0.6 MPa < 18 MPa	
	Replaced in 2013 by 305373 EN12094-10 Compliant and certified Change over switch		
305375	0-400 bar sp 249 EN12094	24.9 ± 1.0 MPa < 27 MPa	
	Replaced in 2013 by 305374 EN12094-10 Compliant and certified Change over switch		
303013	0-250bar sp 150 conn	150 ± 0.6 MPa < 18 MPa	
	Predecessor to 3050370 EN12094-10 Compliant Not certified to EN12094-10 Switch open at low pressure		
303014	0-250bar sp 166 conn	16.6 ± 0.6 MPa < 18 MPa	
	Predecessor to 3050370 EN12094-10 Compliant Not certified to EN12094-10 Switch open at low pressure		

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Category:

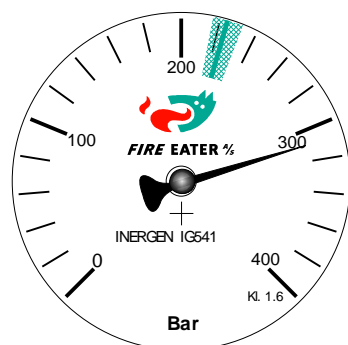
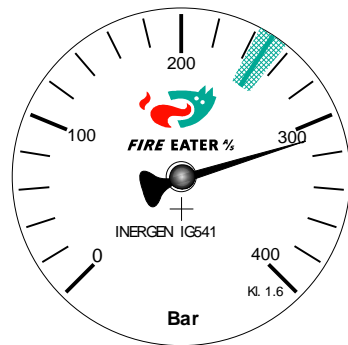
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303017	0-400bar sp 225 conn		22.5 ± 1.0 MPa < 27 MPa	
	Predecessor to 3050375 EN12094-10 Compliant Not certified to EN12094-10 Switch open at low pressure			
303018	0-400bar sp 249 conn		24.9 ± 1.0 MPa < 27 MPa	
	Predecessor to 3050375 EN12094-10 Compliant Not certified to EN12094-10 Switch open at low pressure			

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**Installation**

When fitting the device to the discharge valve a special copper disc (FE item 212181) must be used for sealing and allowing positioning of the gauge, this seal can be used only one time.

**Tightening instruction**

Tighten until thread bottom touches seal

Tighten additionally minimum 0.5 turn, max 1.5 turn

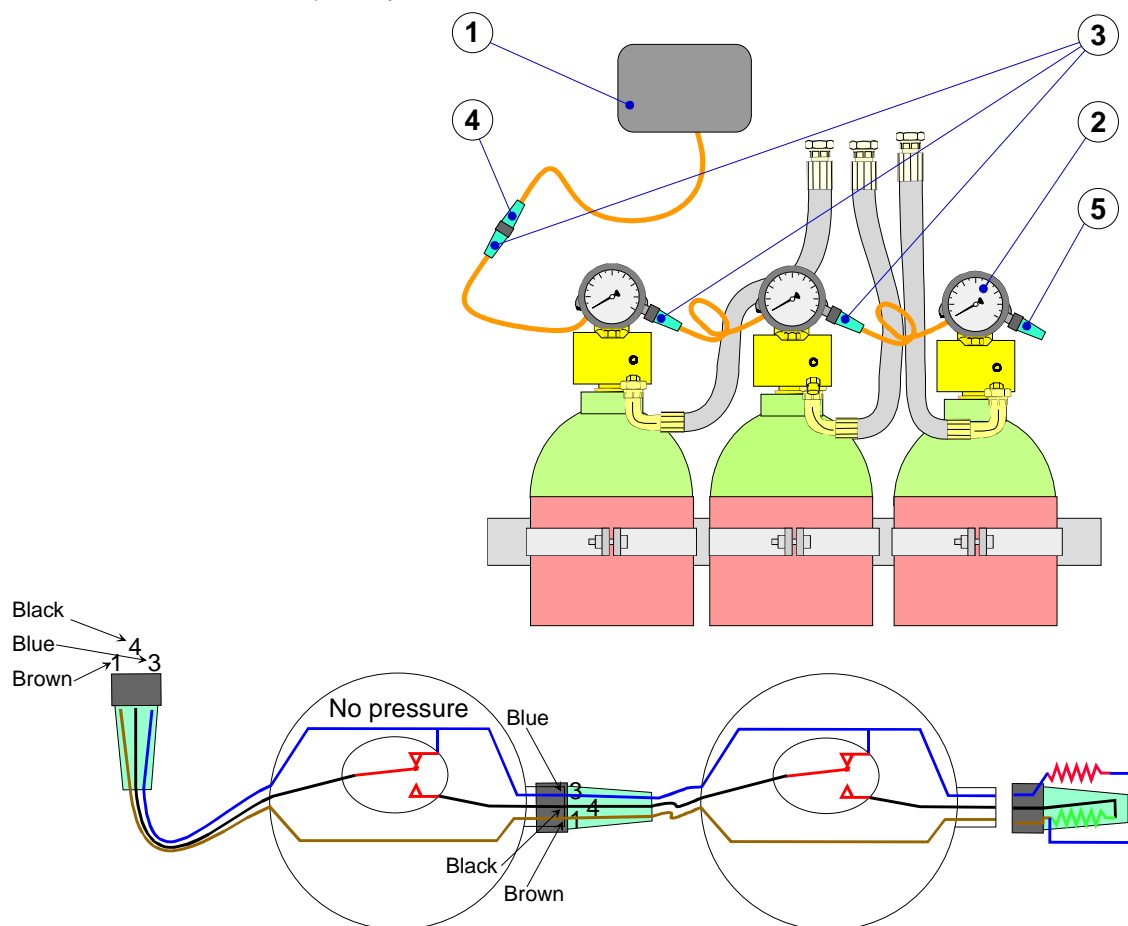
It is not acceptable to loosen the gauge without replacing the seal. Torque (for tightening or loosening) must never be applied to the manoswitch **housing**, but only directly to the stem square.

Electrical connection is made by connecting the switches in series as per drawing below.

**Installation example**

- 1: Connection to control panel
- 2: This manoswitch (pressure gauge with built-in pressure switch)
- 3: Connections between pressure switches
- 4: Connection to cable to control panel
- 5: Terminator (end of line resistors (normal and low pressure))

In the electrical sketch only two pressure switches are shown.



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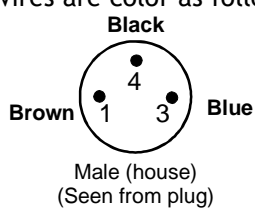
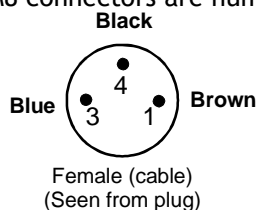
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**Electrical connection**

The M8 connectors are numbered and wires are color as follows:

**Example**

Above is an example showing how two gauges are connected in a daisy-chain and fitted with end of line resistors.

If just one of the gauges has a low pressure the switch will change over (to the shown position) and electricity will pass through the red resistor (typically 470 ohm) whereas the green resistor is 6k8 which is the resistance when there is no low pressure.

**Operating**

No operations are necessary.

When pressure is above the set-point the resistance in the circuitry is 6K8 ohm, if the pressure on one of the gauges falls below the set-point the resistance of the circuitry will fall to 470 ohm.

**Maintenance**

No requirements.

**Routine testing**

Verify correct circuitry by removing the end of line resistors annually.  
Local authorities may require additional testing.

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**Symbol**

Both of below symbols can be used.

Pi: is Pressure indication

ZSC: is for the pressure switch closed when system is pressurized (normal operating condition).

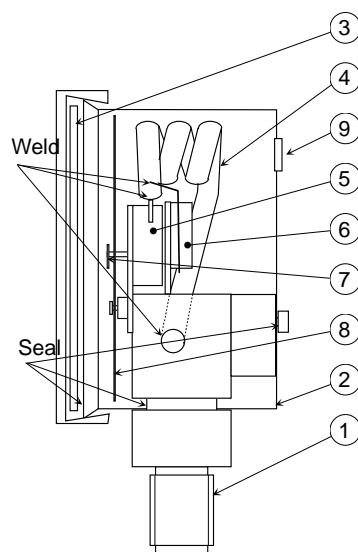
**Section drawings**

Position	Description
1	Socket
2	Casing
3	Lens
4	Bourdon tube
5	Moving mechanism
6	Switch
7	Pointer
8	Dial
9	Blow-out plug

**Not shown**

M8 male connector

Cable w M8 female connector

**Standards & approvals**

See Table 1-3 for approvals.

Gauges are also in compliance with PED Directive and EN 839 Standard.

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**Declaration of Performance**

Nr. Manoswitch 2014-11-06

## 1. Product type identification:

Ci-Manoswitch

305073	28.4MPa sp16.6
305374	43.1MPa sp24.9
305360	0-160 bar sp50
305370	0-250 bar sp 166
305375	0-400 bar sp 249
305371	15MPa sp12.24 GA400
305372	20MPa sp16.6 GA400

## 2. Type identification:

"Ci-MANSW" xxx (xxx= Dial value)  
serial number, Logo,

## 3. Intended use:

Inert gas Fire suppression system

## 4. Manufacturer:

Fire Eater A/S  
Vølundsvej 14, DK-3400 Hillerød  
Denmark

## 5. NA

## 6. Assessment system:

System 1

## 7. Certification body for this product is

CNPP Cert

CNPP certificate: 1116-CPR-016

Test report: CNPP GH 08 0021

## 8. NA

## 9. Performance

Product type	Pressure gauge w. Pressure Switch
Operating temp	-40 to +70 °C
Type of system	Inert gas system
Work pressure	0 - 40 MPa, 0-25 MPa, 0-160 Bar
Burst pressure	>110 MPa
Mounting	Any

## 10. On behalf of Fire Eater

Signature: 

Michael Kroneder, CTO

Hillerød 2014-11-06

**Document:**

DoP Ci Manoswitch 2014-11-06

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Rev:2014.11.06



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www.fire-eater.com

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