



# MSRT 150 W/WF WINDING TEMPERATURE INDICATOR



**WINDING TEMPERATURE INDICATOR  
150W/WF**

The temperature of a transformer winding is an important indicator of the load and performance and should be monitored continuously to prevent unacceptable overload and possible thermal degradation. However the winding by its very nature will be at raised potential making direct sensing impossible. Comem overcome this problem by indirect sensing using Thermal Image Technology.

Basically the sensor comprises a heat sensitive resistive circuit through which passes a current. The thermometer can be fine tuned via the potentiometer on the indicator dial.

These instruments can be supplied with or without a fixing bracket (flange) and can be fitted with up to four changeover micro-switches for control of cooling or for operating alarm and trip circuits.

**COMPONENT SPECIFICATION**

**Temperature sensing system:** expansion type. The sensing system is filled with a special organic fluid and has a built in compensation for changes in ambient temperature.

**Sensing system components:** Bulb - bronze or stainless steel. Capillary tube - copper or stainless steel. Bourdon spring - bronze.

**Capillary tube protection:** copper tube. Flex galvanized steel + PVC armouring or flexible AISI 304 stainless steel armouring.

**Casing:** aluminium alloy, powder coated (RAL 7035). The paint finish is designed to resist even the most aggressive climate and polluted atmosphere. The case is provided with a breather to prevent condensation in the lens. Wiring is facilitated by the provision of a large junction box separate from the sensing system.

**Mechanical Protection: IP 65.** The instruments are suitable for mounting outdoors in tropical or arctic climates (ambient temperature from -40 to +70 °C). All components are manufactured from corrosion proof material or given protective surface treatments.

**Lens:** Special glass or polycarbonate.

**Locking ring:** chrome-plated brass.

**Standard measuring ranges:** 0/150 °C, 0/160 °C.

**Measuring Tolerance:** 1.5% of full scale value.

**Repeat Accuracy:** 2% of full scale value.

**Microswitches:** Insulation - 2000V, 50Hz between terminal and earth for 60 secs. Make/break capacity - see table below.

**Thermal image current:** the heating resistance circuit wound around the sensing bulb is powered by the CT fitted to the transformer. Both this resistance and the potentiometer that regulates it are sized according to the available current from the CT.

Standard values are: 1A, 1.5A, 2A, 5A. This value must be clearly specified at the time of ordering.

NO MATCHING UNIT IS REQUIRED.

VOLTAGE	Standard microswitches		High-perform. microswitches	
	Resistive load	Inductive load	Resistive load	Inductive load
125V AC	5 A	5 A	10 A	10 A
250V AC	5 A	5 A	10 A	10 A
30V DC	5 A	3 A	10 A	10 A
50V DC	1 A	1 A	3 A	2.5 A
75V DC	0.75 A	0.25 A	1 A	0.5 A
125V DC	0.5 A	0.1 A	0.5 A	0.1 A
250V DC	0.25 A	0.1 A	0.25 A	0.1 A

**OPTIONS**

**Max. temperature pointer:** a red drag hand pointer, with reset knob located on the lens.

**Back flange:** bracket for wall mounting. Four holes 7 mm dia. on 175 mm PCD.

**Elastic suspension:** this device offers damping for excess vibration.

**Earthquake proof version:** fitted with the elastic suspension, and some modification to internal components.

**PT 100 sensor:** for remote monitoring.

**Remote display:** a 48 x 96 mm digital display from the PT 100 SENSOR.

# WINDING TEMPERATURE INDICATOR type MSRT 150 / W

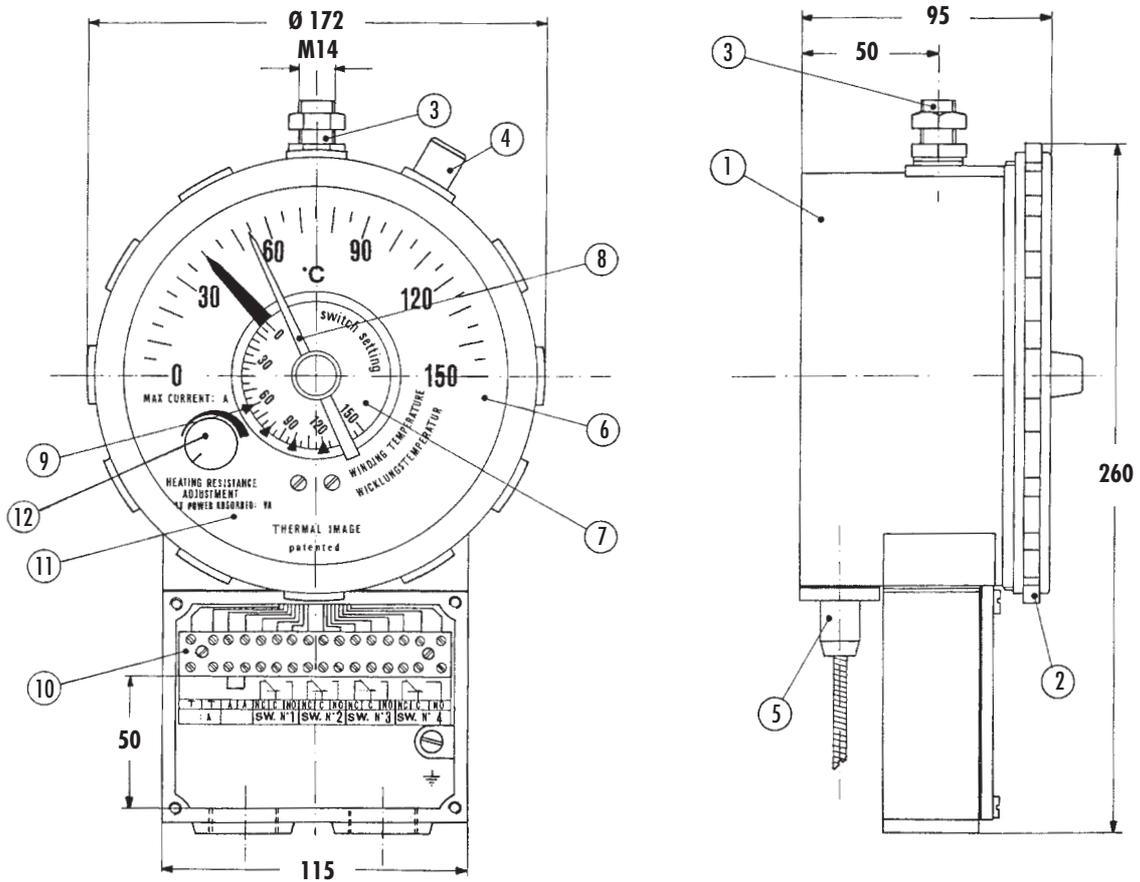


Fig. A1

- |    |   |    |   |
|----|---|----|---|
| 1  | Casing  | 11 | Glass or polycarbonate transparent                        |
| 2  | Locking glass ring  | 12 | Potentiometer for thermal image heating system adjustment |
| 3  | Rigid mounting screw<br>(elastic suspension - vibration damping system = Fig. H1) |    |   |
| 4  | Breather device   |    |   |
| 5  | Capillary output  |    |   |
| 6  | Dial  |    |   |
| 7  | Microswitches setting dial  |    |   |
| 8  | Max temperature pointer   |    |   |
| 9  | Microswitch setting pointer   |    |   |
| 10 | Terminal box  |    |   |

## WINDING TEMPERATURE INDICATOR type MSRT 150 / WF

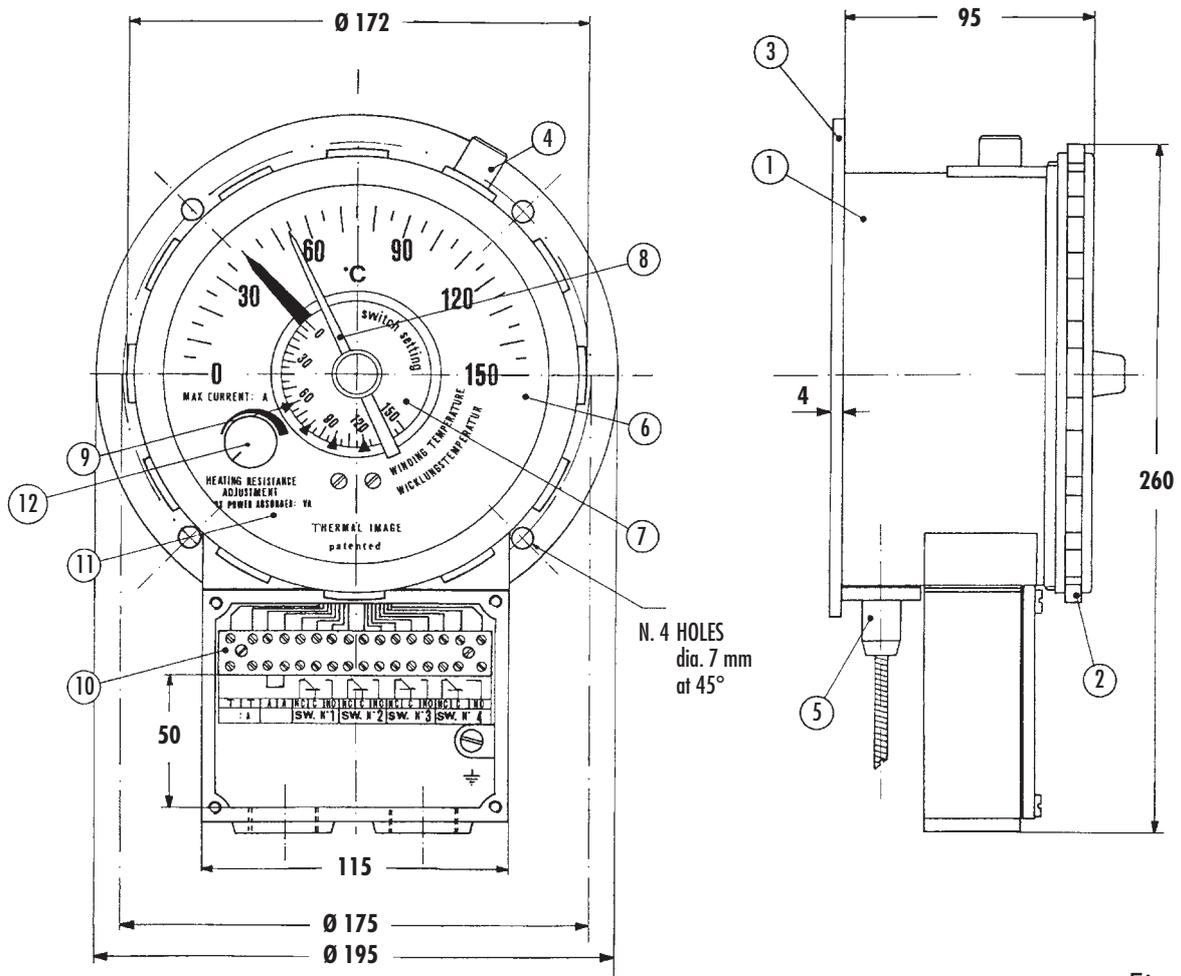


Fig. B1

- |                               |  |
|-------------------------------|--|
| 1 Casing                      | 11 Glass or polycarbonate transparent                        |
| 2 Locking glass ring          | 12 Potentiometer for thermal image heating system adjustment |
| 3 Mounting back flange        |  |
| 4 Breather device             |  |
| 5 Capillary output            |  |
| 6 Dial                        |  |
| 7 Microswitches setting dial  |  |
| 8 Max temperature pointer     |  |
| 9 Microswitch setting pointer |  |
| 10 Terminal box               |  |

## WINDING TEMPERATURE INDICATOR type MSRT 150 W / WF ORDERING SHEET

<b>Instrument type :</b>					MSRT 150-WF	MSRT 150-W
					<input type="checkbox"/>	<input type="checkbox"/>
<b>Range :</b>					0°/+150° C	0°/+160° C
					<input type="checkbox"/>	<input type="checkbox"/>
<b>Number of microswitches :</b>			1	2	3	4
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Capillary length :</b>		1 m	2 m	4 m	6 m	other...
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Bulb : Fig. G1</b>					Fig. 1 <i>(female connection)</i>	Fig. 2 <i>(male connection)</i>
					<input type="checkbox"/>	<input type="checkbox"/>
<b>Bulb length : Fig. G1</b>					L = _____ mm. <i>(thread included in)</i>	
<b>Bulb thread of connection F = Fig. G1</b>				F = 3/4" BSP	F = 1" BSP	other...
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Maximum temperature resettable pointer :</b>					YES	NOT
					<input type="checkbox"/>	<input type="checkbox"/>
<b>Options :</b>					PT 100 SENSOR	ELASTIC SUSPENSION
					<input type="checkbox"/>	<input type="checkbox"/>
					4...20mA TRANSMITTER	DIGITAL READOUT METER
					<input type="checkbox"/>	<input type="checkbox"/>
<b>Nominal current from current transformer:</b>			1A	1.5A	2A	5A
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Cable entries:</b>			No.2 3/4BSP	No.2 PG 16	No.3 PG 16	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# MSRT 150 / F OIL TEMPERATURE INDICATOR



## OIL TEMPERATURE INDICATORS FOR POWER TRANSFORMERS TYPE MSRT 150, 150F.

These thermometers are designed to measure the temperature of the insulating oil in the transformer. They can be supplied with a side facing or front facing terminal box with or without fixing bracket (flange) and can be fitted with up to four changeover micro-switches for control of cooling or for operating alarm and trip circuits.

### COMPONENT SPECIFICATION

**Temperature sensing system:** expansion type. The sensing system is filled with a special organic fluid and has a built in compensation for changes in ambient temperature.

**Sensing system components:** Bulb - bronze or stainless steel. Capillary tube - copper or stainless steel. Bourdon spring - bronze.

**Capillary tube protection:** copper tube. Flex galvanized steel + PVC armouring or flexible AISI 304 stainless steel armouring.

**Casing:** aluminium alloy, powder coated (RAL 7035). The paint finish is designed to resist even the most aggressive climate and polluted atmosphere. The case is provided with a breather to prevent condensation in the lens. Wiring is facilitated by the provision of a large junction box separate from the sensing system.

**Mechanical Protection: IP 65.** The instruments are suitable for mounting outdoors in tropical or arctic climates (ambient temperature from -40 to +70 °C). All components are manufactured from corrosion proof material or given protective surface treatments.

**Lens:** Special glass or polycarbonate.

**Locking ring:** chrome plated brass.

**Standard measuring ranges:** 0/+120° C  
-20/+130° C  
0/+150° C  
-20/+140° C  
0/+160° C  
0/+200° C

**Measuring tolerance:** 1.5% of full scale value.

**Repeat Accuracy:** 2% of full scale value.

**Microswitches:** Insulation - 2000V, 50Hz between terminal and earth for 60 secs. Make/break capacity - see the table below.

VOLTAGE	Standard microswitches		High-performance microsw.	
	Resistive load	Inductive load	Resistive load	Inductive load
125V AC	5 A	5 A	10 A	10 A
250V AC	5 A	5 A	10 A	10 A
30V DC	5 A	3 A	10 A	10 A
50V DC	1 A	1 A	3 A	2.5 A
75V DC	0.75 A	0.25 A	1 A	0.5 A
125V DC	0.5 A	0.1 A	0.5 A	0.1 A
250V DC	0.25 A	0.1 A	0.25 A	0.1 A

### OPTIONS

**Max. temperature pointer:** a red drag hand pointer, with reset knob located on the lens.

**Back flange:** bracket for wall mounting. Four holes 7 mm dia. on 175 mm PCD.

**Elastic suspension:** this device offers damping for excess vibration.

**Earthquake proof version:** fitted with the elastic suspension, and some modification to internal components.

**PT 100 sensor:** for remote monitoring.

**Remote display:** a 48 x 96 mm digital display from the PT 100 SENSOR.

## MSRT 150 OIL TEMPERATURE INDICATOR

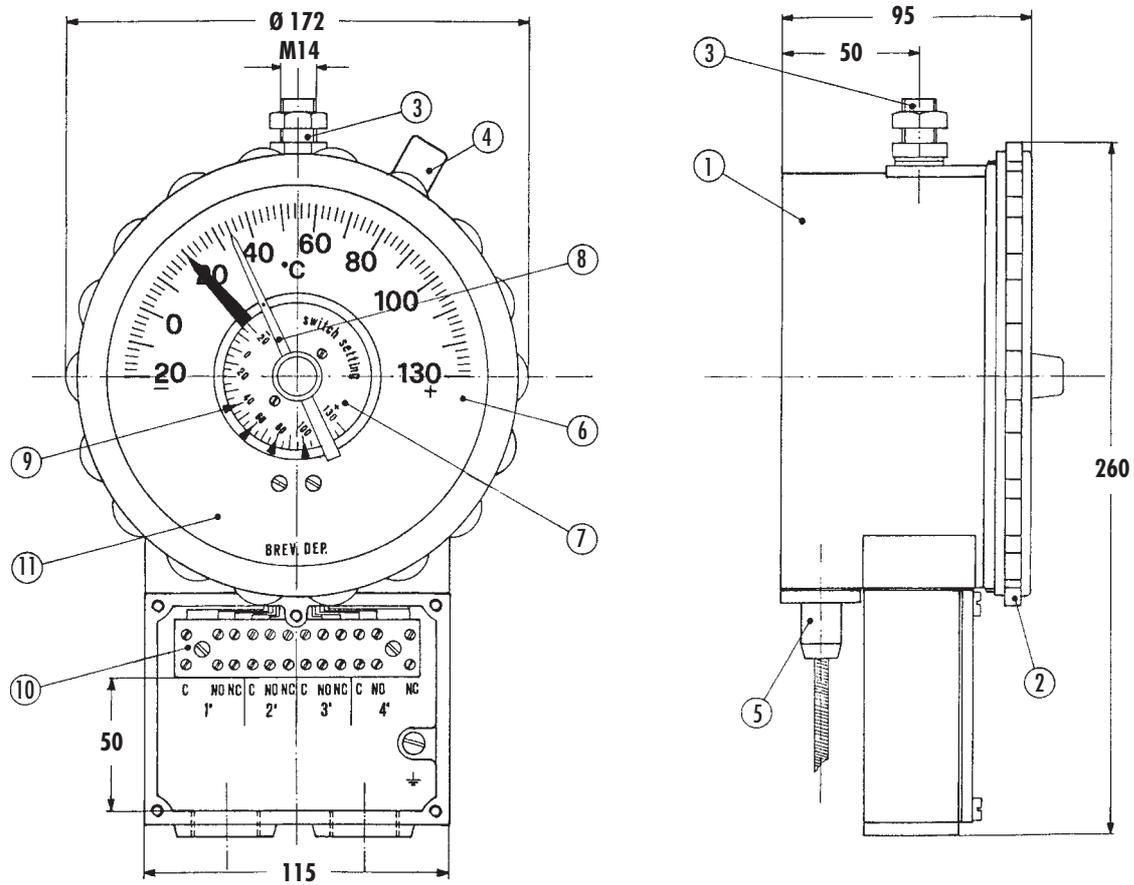


Fig. - C1

- |   |   |    |                                    |
|---|---|----|------------------------------------|
| 1 | Casing  | 10 | Terminal box                       |
| 2 | Locking glass ring  | 11 | Glass or polycarbonate transparent |
| 3 | Rigid mounting screw<br>(elastic suspension - vibration damping system : Fig. H1) |    |                                    |
| 4 | Breather device   |    |                                    |
| 5 | Capillary output  |    |                                    |
| 6 | Dial  |    |                                    |
| 7 | Microswitches setting dial  |    |                                    |
| 8 | Max temperature pointer   |    |                                    |
| 9 | Microswitch setting pointer   |    |                                    |

## MSRT 150 F OIL TEMPERATURE INDICATOR

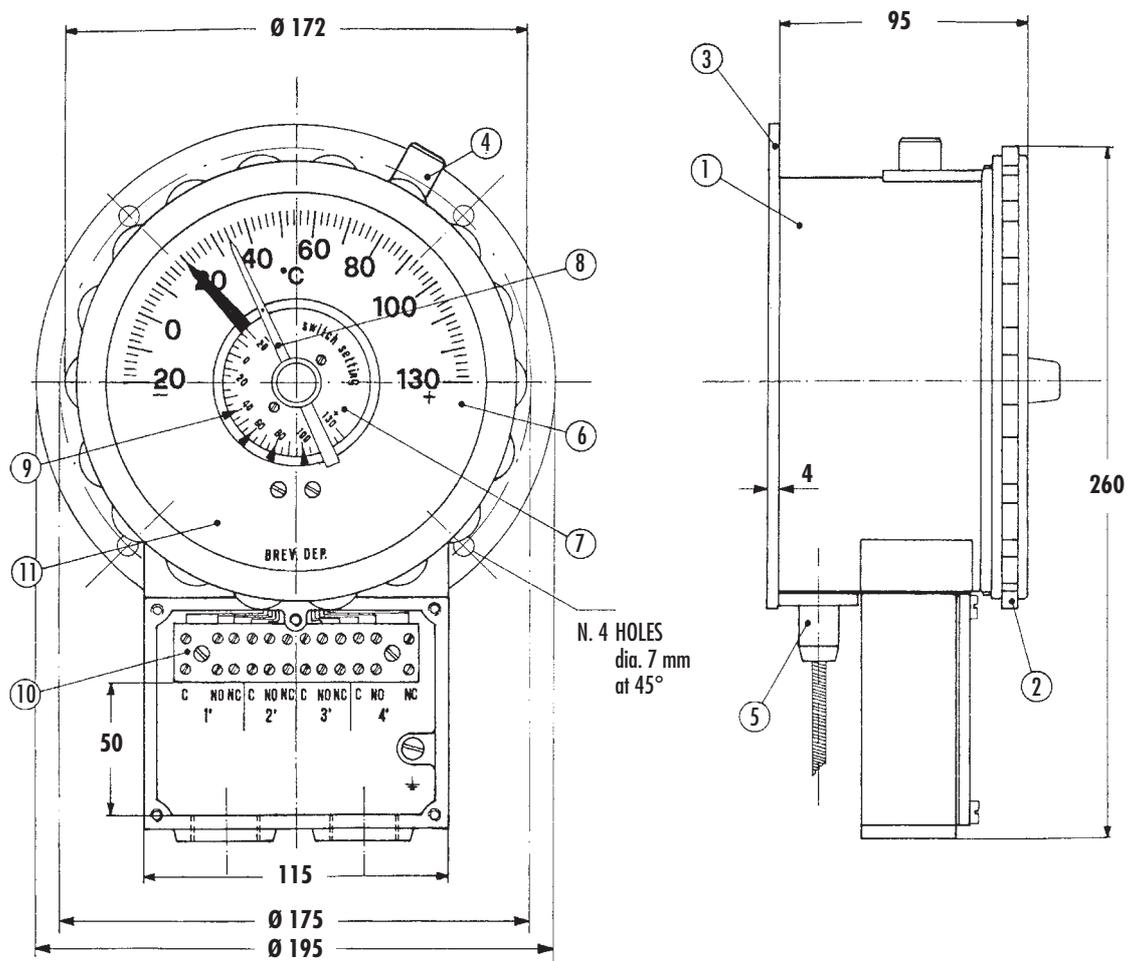


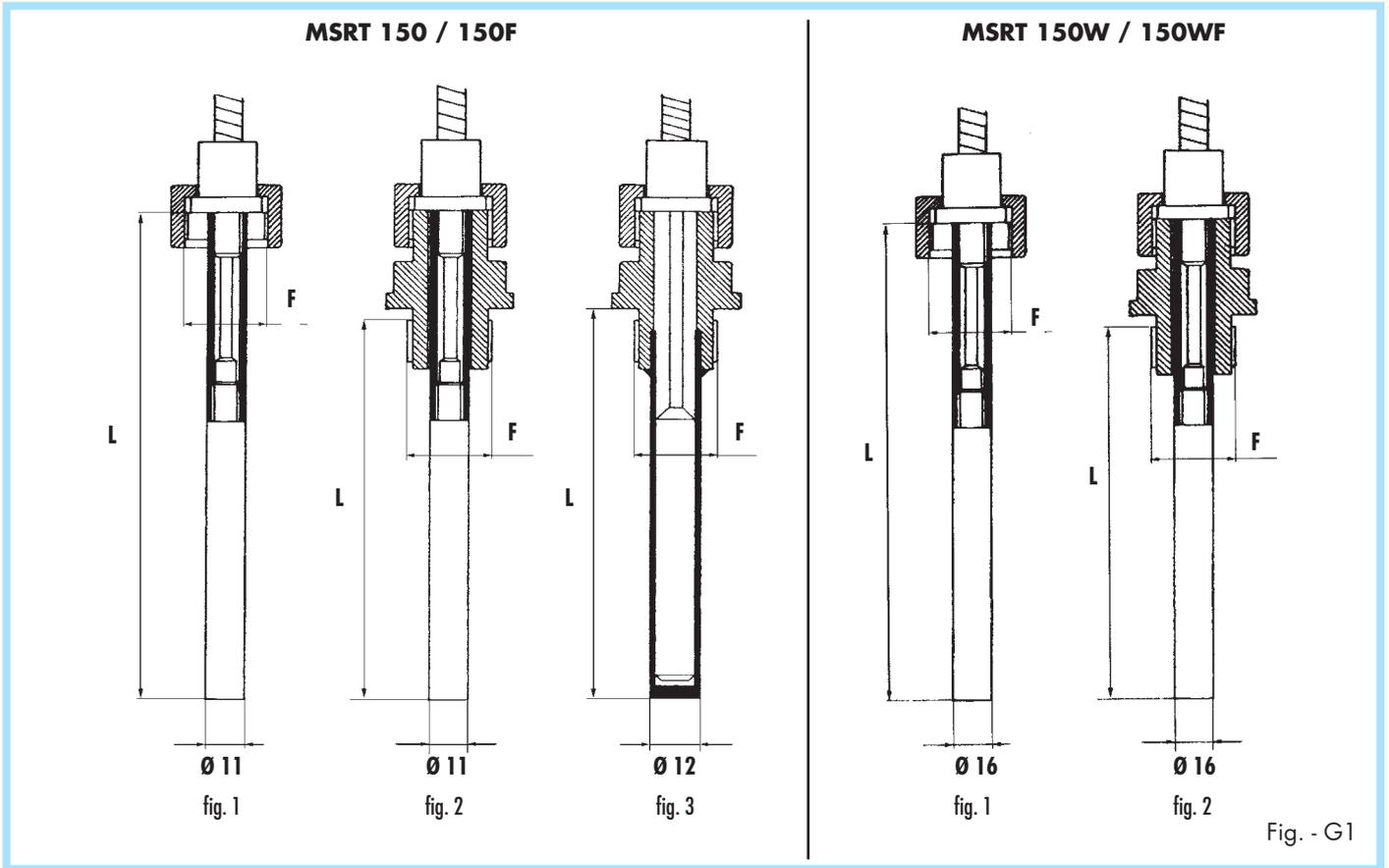
Fig. - D1

- |                              |                                       |
|------------------------------|---------------------------------------|
| 1 Casing                     | 9 Microswitch setting pointer         |
| 2 Locking glass ring         | 10 Terminal box                       |
| 3 Mounting back flange       | 11 Glass or polycarbonate transparent |
| 4 Breather device            |                                       |
| 5 Capillary output           |                                       |
| 6 Dial                       |                                       |
| 7 Microswitches setting dial |                                       |
| 8 Max temperature pointer    |                                       |

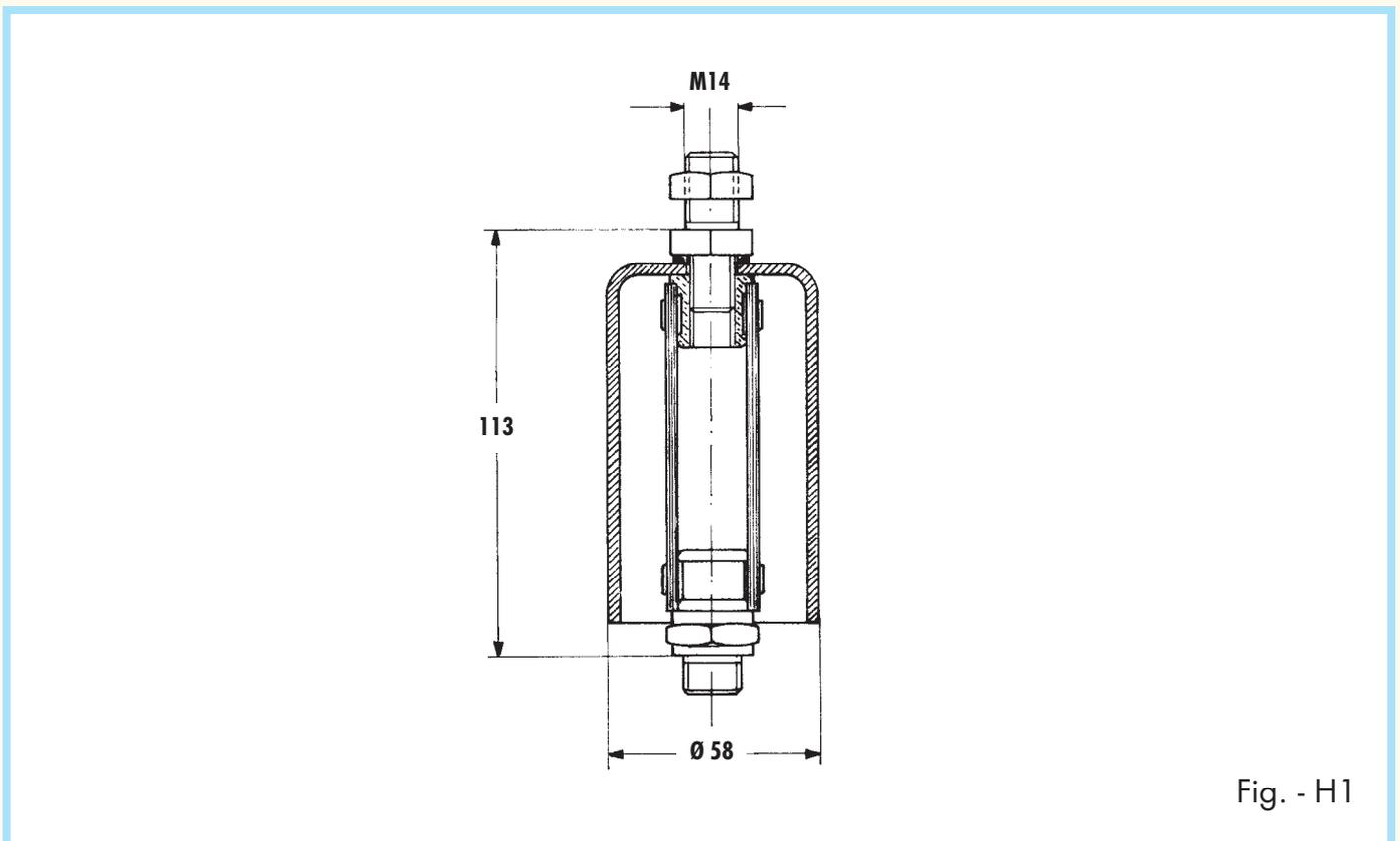
## OIL TEMPERATURE INDICATOR type MSRT 150 / F ORDERING SHEET

<b>Instrument type :</b>				MSRT 150	MSRT 150-F	
				<input type="checkbox"/>	<input type="checkbox"/>	
<b>Range :</b>			0°/+150° C	-20°/+130° C	-20°/+140° C	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Number of microswitches :</b>		1	2	3	4	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Capillary length :</b>		1 m	2 m	4 m	6 m	other...
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Bulb shape : Fig. G1</b>				Fig. 1 <i>(female connection)</i>	Fig. 2 <i>(male connection)</i>	
				<input type="checkbox"/>	<input type="checkbox"/>	
<b>Bulb length L = Fig. G1</b>					L = _____ mm. <i>(thread included in)</i>	
<b>Bulb thread of connection F = Fig. G1</b>		F= 1/2" BSP	F= 3/4" BSP	F= 1" BSP	other...	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Maximum temperature resettable pointer :</b>				YES	NOT	
				<input type="checkbox"/>	<input type="checkbox"/>	
<b>Options :</b>				PT 100 SENSOR	ELASTIC SUSPENSION	
				<input type="checkbox"/>	<input type="checkbox"/>	
<b>Cable entries:</b>				4...20mA TRANSMITTER	DIGITAL READOUT METER	
				<input type="checkbox"/>	<input type="checkbox"/>	
<b>Cable entries:</b>		No.2 3/4" BSP	No.2 Pg 16	No.3 Pg 16		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

## TEMPERATURE INDICATOR BULBS



## ELASTIC SUSPENSION



# DIGIT READ OUT METER FOR OIL OR WINDING

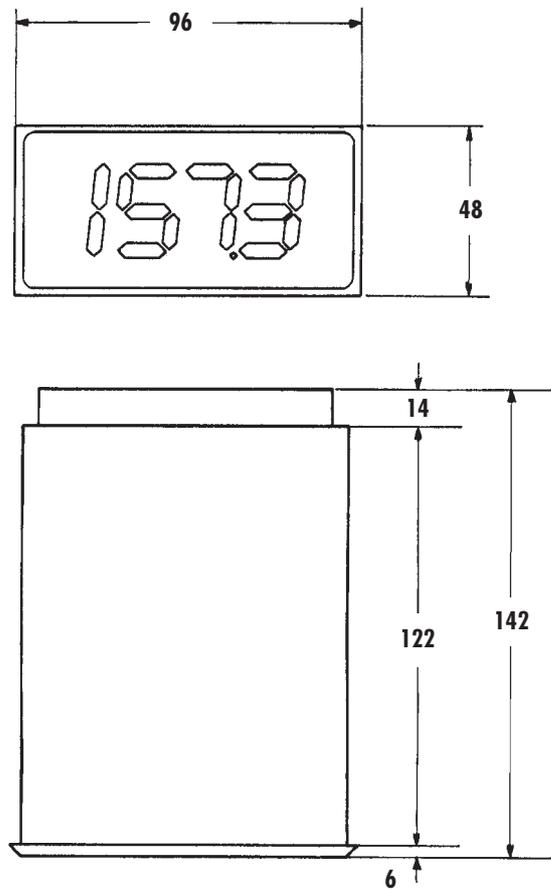


Fig. - 11



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