

FP-C Flameproof Removable Core Immersion Heaters

The FP-C range of flameproof removable single and multi-core heaters offers a hazardous area heating solution for oil and similar applications where low heat density is required. Designed for convenience, the elements can be withdrawn for inspection without system drain down. A standard heater consists of a single element (or multiple cores) fitted into a mounting flange. A robust Ex d terminal enclosure protects the electrical connections. The watts density of the element core fitted depends upon the media to be heated and the kilowatt rating required.

The FP removable core-type immersion heater range is certified for use in hazardous areas where the atmosphere is classified as a Zone 1 or 2 (IIA, IIB, IIC) gas group, or a Zone 21 or 22 (IIIA, IIIB, IIIC) dust group.



FEATURES

Certified to meet the ATEX Equipment Directive and IECEx

Mild steel or 316 stainless steel terminal enclosure with weatherproof protection to IP66 or NEMA 4

Choice of built in process temperature sensors

Suitable for ambient temperatures from -60°C to +60°C (subject to cert parameters)

Mounting of the heater can be by a threaded NPT or BSP boss or an industry standard flange

Designed for horizontal installation (vertical mounting version available on request)

Can be supplied with the terminal box mounted away from the fixing boss / flange

TYPICAL APPLICATIONS

Pre-heating oil / water

Processing equipment

Cleaning and rinsing tanks

Heat transfer systems

Boiler equipment

Frost protection

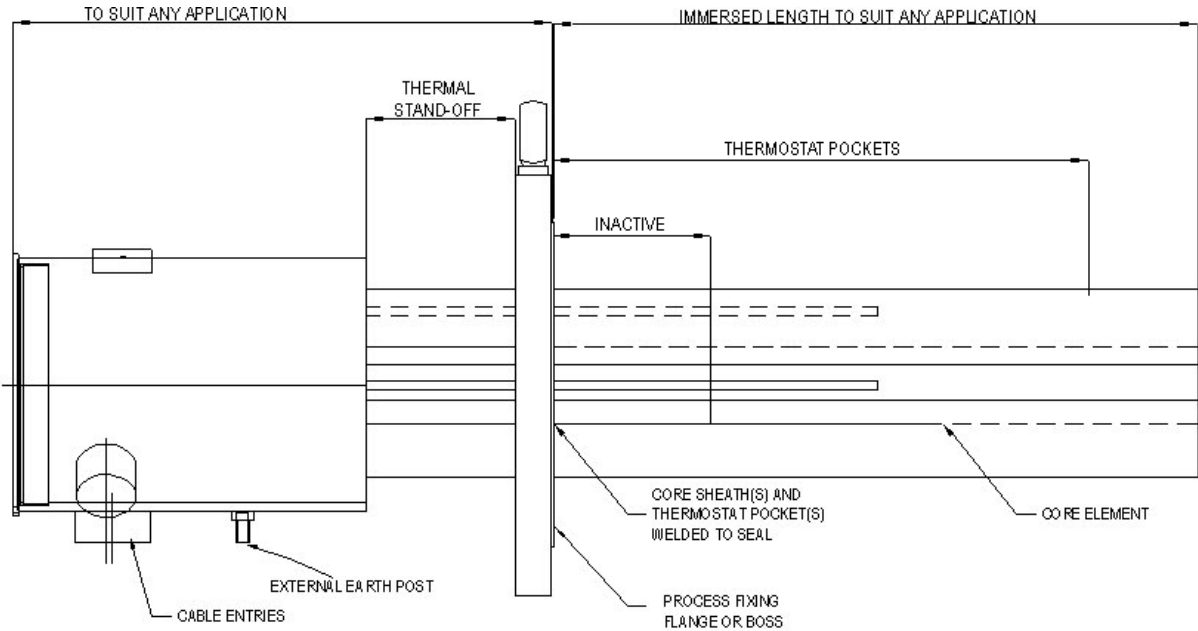
Compressors

Turbines

Water / glycol cooling

Lube oil reservoirs

Oil separators



Terminal Box Type	Min Flange Size		kW LOAD with a maximum immersed Length of 2800mm	
	Ins	mm	Max Cable Entries	Max Number of Cores
FP 4	3 (2*)	75 (50*)	1 off M25 & 1 off M20	1
FP 6	6	150	1 off M32 & 2 off M25	3
FP 8	8	200	2 off M25 & 1 off M40	6
FP 10	10	250	2 off M32 & 1 off M25	9
FP 12	12	300	3 off M32 & 1 off M20	12

*used flange size

Certifications

ATEX / IECEx (Ex) II 2 G/D
 Ex d IIC T1 to T6 Gb Zone 1 and 2
 Ex tb IIIC T450 to 85°C Db Zone 21 and 22
 EN 60079-0, EN 60079-1, EN 60079-7, EN 60079-31
 CSA Class I, Division 1, Groups A, B, C, D; Temperature coded T1 to T6; Enclosure type 4
 CAN Zones: CSA Ex d IIC; T1 to T6 Gb, IP66
 USA Zones: CSA Class I, Zone 1, AEx d IIC; T1 to T6 Gb, IP66
 CU TR (formerly GOST); Inmetro; KGS; CNEEx; CCOE

Enclosure

Mild steel or 316 stainless steel external and internal earths, screwed terminal cover, finished in epoxy paint (if required)

Elements

Removable core, comprising high quality 80/20 nickel chrome resistance wire, contained within ceramic formers housed in plain or extended surface tubes

Controls

Heater over-temperature protection is fitted as standard (optional process temperature sensing devices can be incorporated in the form of thermostats RTD's or thermocouples)

Mounting

Any threaded NPT or BSP boss or flange in any material can be specified within the limits of the design parameters; heater terminal box can be either 'direct-on' or 'stand-off', depending on process temperature

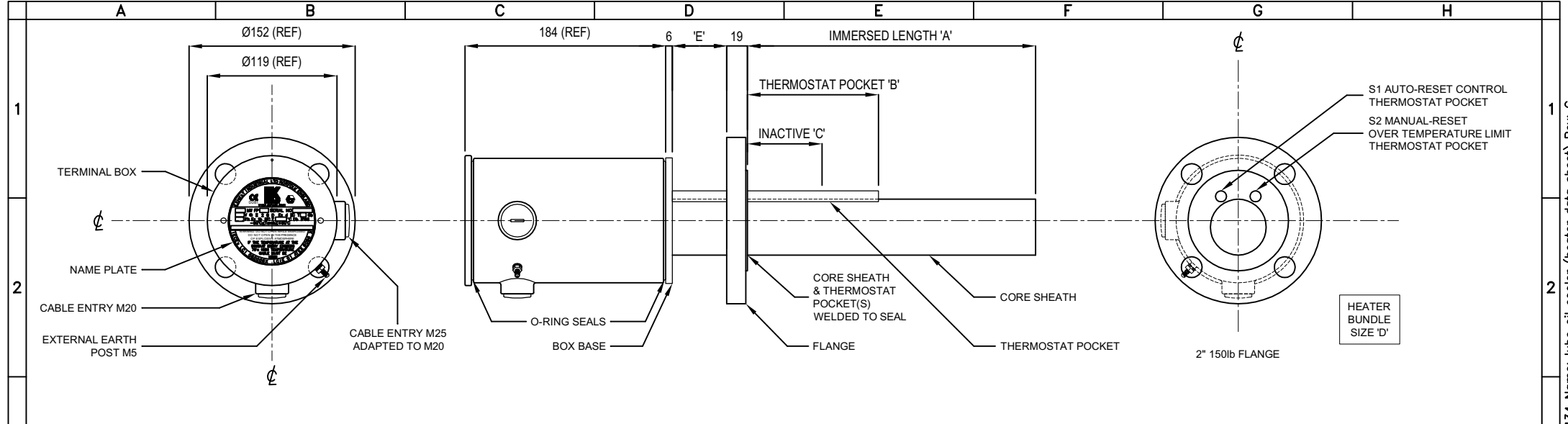
Rating

To suit process requirements within the design and certification parameters

Voltage

Any electrical supply up to 690V (600V CSA)

ID: E1A1642434 Name: lube oil cooler (heater data sheet) Rev: C Author: IN215136 2017-04-24 Reviewer: -- Approver: gopas00s 2017-04-24



NOTES:

- RATING:**
3.5KW ON 400V, 3PH, 50/60HZ (4 WIRE STAR)
- MATERIAL:**
CORE TYPE ELEMENTS: 1.5" WITHDRAWABLE CERAMIC
CORE SHEATH: PLAIN SURFACE 316L STAINLESS STEEL
THERMOSTAT POCKET(S): 316L STAINLESS STEEL
TERMINAL BOX: 316L STAINLESS STEEL FP4 TERMINAL BOX IP66 RATED
NAMEPLATE: 316L STAINLESS STEEL
CABLE ENTRY ADAPTORS: NICKEL PLATED BRASS
PROCESS FIXING: 2" NB 150LB ANSI RF BLIND 316L STAINLESS STEEL FLANGE
- FINISH:**
TERMINAL BOX LID, BODY & FLANGE - STAINLESS NATURAL
REMAINDER NATURAL
- MAX WORKING PRESSURE** 13 BARg
- INSPECTION AND TESTING:**
HYDRO TEST TO WI/09/110
TEST METHOD 1. TO 20 BARg FOR 15 MINUTES
TEST METHOD 2.
REFER TO LATEST REVISION OF CERTIFICATE LCIE 01 ATEX 6056 X
ELECTRICAL TEST TO WI/09/114.
100% VISUAL AND DIMENSIONAL CHECK
- CABLE ENTRIES:**
1x M25 x1.5p (POWER) ADAPTED TO M20, 1x M20 x1.5p (CONTROL).
CABLE ENTRIES FITTED WITH TEMPORARY PLUGS
ANY UNUSED ENTRIES MUST BE FITTED WITH SUITABLE CERTIFIED BLANKING PLUGS AT ALL TIMES. UNDER NO CIRCUMSTANCES ARE ANY ENTRIES TO BE LEFT OPEN. DUE TO THE NATURE OF THE SCREW THREADS ON THE TERMINAL BOX, THE CABLE ENTRIES MAY NOT BE IN THE POSITION SHOWN ON THE DRAWING.
- CONTROLS:**
S1: 1 X AUTO RESET CONTROL (SPDT) THERMOSTAT RANGE 0/+120°C
MAX PROCESS SET POINT +100°C (5-7°C HYSTERESIS)
S2: 1 X MANUAL RESET OVER-TEMPERATURE LIMIT THERMOSTAT SET AT +120°C
S3: 1 X MANUAL RESET BOX CUT OUT SET AT +80°C
(LOCATED WITHIN THE TERMINAL BOX TO PREVENT OVERHEATING)
- HEATER CERTIFICATION:**
ATEX/IECEX CERTIFIED Ex II 2 G D Ex d IIC T4 Gb Ex tb IIIC T135°C Db
CERTIFICATE No. LCIE 01 ATEX 6056 X, IECEX LCI 06 0006 X
- OVERTEMPERATURE PROTECTION:**
EACH HEATER SHALL BE FITTED WITH 1 OFF (MINIMUM) SENSOR FOR THE HEATER MOUNTING FLANGE/PROCESS TEMPERATURE AND 1 OFF TERMINAL BOX CUT-OUT SENSOR. THE SENSORS SHALL BE THERMOSTAT, THERMOCOUPLE OR RTD. THE SENSORS SHALL BE CONNECTED TO A SUITABLE TEMPERATURE CONTROL SYSTEM TO SHUT DOWN THE HEATER IN THE EVENT THE MAXIMUM TEMPERATURE IS EXCEEDED. OVERTEMPERATURE SENSOR & CUT-OUT MUST BE MANUAL RESET EITHER BY:
a.) AUTO-RESET THERMOSTAT & AUTO RESET CUT-OUT BEING, RESET AT CONTROL PANEL BY KEY SWITCH OR SPECIAL TOOL.
b.) SENSOR & CUT-OUT BEING MANUAL RESET UNITS, ie MANUAL RESET INSIDE TERMINAL BOX.
- AMBIENT TEMPERATURE:** -60°C ≤ T_{amb} ≤ +60°C
- WATTS DENSITY:** 2.0 W/cm²
- APPROX. WEIGHT:** 19KG
- TAG INFORMATION (WHERE APPLICABLE):**
REFER TO RELEVANT ITEM ON SALES ORDER
- CORE ELEMENT OVER 1500MM SHOULD BE SUPPORTED TO AVOID UNNECESSARY STRAIN ON THE WELD.**

**FOR WIRING
INFORMATION
SEE: 028869.01.03**

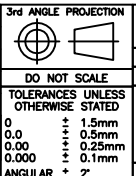
VARIABLE DETAILS

LENGTH 'A'	1550mm	SIZE 'D'	Ø51mm
LENGTH 'B'	240mm	LENGTH 'E'	100mm
LENGTH 'C'	100mm	LENGTH 'F'	N/A

CERTIFIED PRODUCT

NO MODIFICATIONS PERMITTED WITHOUT THE APPROVAL OF THE QA MANAGER.
DOES THIS CHANGE AFFECT ANY CERTIFICATION OR CERTIFICATE SCHEDULE DRAWING?
IF YES, RECORD THE DON No. IN THE COLUMN TO THE RIGHT.

DCN No	Y/N	REV	DATE	COMMENTS	DRWN	CHKD	APPR
1		19.09.16		TERMINAL BOX MATERIAL & MODEL NUMBER UPDATED (S)	PS		
0		04.08.16		FIRST ISSUE	PS	PB	KP



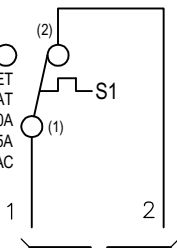
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
DO NOT SCALE!
IF IN DOUBT, ASK!
WHERE ELECTRONIC DOCUMENTS ARE SUPPLIED, THE END PRODUCT MUST CONFORM TO THE PAPER ORIGINAL.
FORMAT: AUTOCAD



TITLE	
FP4S-CS1-3.5-61-FS2-S0 GENERAL ARRANGEMENT DRAWING INDUSTRIAL PRODUCT	
EXHEAT DRAWING NUMBER	REV
028869.01.01	01

ID: E1A1642434 Ngms: lube oil cooler (heater data sheet) Rev: C
Author: in215156 2017-04-24 Reviewer: - - Approver: gopas00s 2017-04-24

(3) ○
 AUTO-RESET
 CONTROL THERMOSTAT
 1-2 MAX CURRENT 20A
 1-3 MAX CURRENT 5A
 MAX VOLTAGE 240V AC

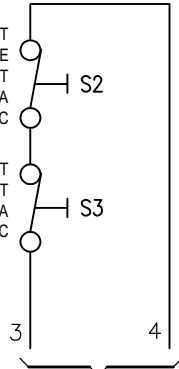


CLIENTS
 PROCESS
 CONTROL
 CONNECTIONS

IH36 / GCS00-320-E-[x]907A
 TS-136 / GCS00-320-TS-[x]907-AB
 IH37 / GCS00-320-E-[x]907B
 TS-137 / GCS00-320-TS-[x]907-BB

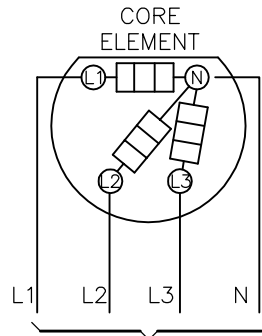
MANUAL-RESET
 OVER TEMPERATURE
 LIMIT THERMOSTAT
 MAX CURRENT: 25A
 MAX VOLTAGE: 250V-AC

MANUAL-RESET
 BOX CUT OUT
 MAX CURRENT: 16A
 MAX VOLTAGE: 250V-AC

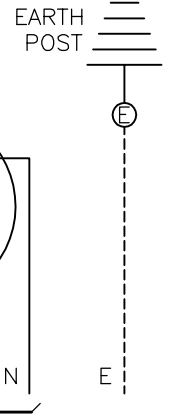


CLIENTS
 SAFETY
 CONTROL
 CONNECTIONS

IH36 / GCS00-320-E-[x]907A
 TS-134 / GCS00-320-TS-[x]907-AA
 IH37 / GCS00-320-E-[x]907B
 TS-135 / GCS00-320-TS-[x]907-BA

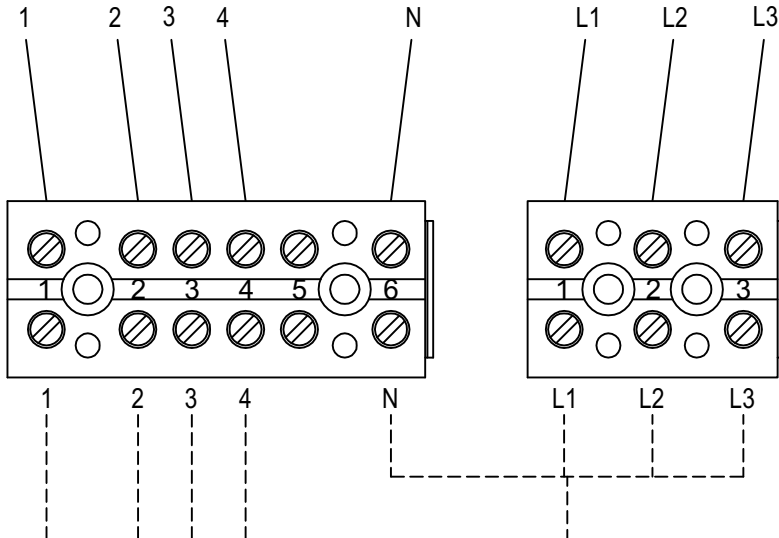


CLIENTS
 POWER
 CONNECTION



CLIENTS
 EARTH
 CONNECTION

CONTROL CIRCUITS



GENERAL NOTES:

1. REFERENCE DRAWING:

(i) GA DRAWING: 028869.01.01

2. CLIENT INCOMING SUPPLY:

- (i) POWER - 3.5kW 400V, 3Ph, (4 WIRE STAR), 50/60Hz. CONNECTING DIRECTLY TO BK3 & BK6 TERMINAL (EXHEAT SUPPLY). SUITABLE FOR TERMINATING UP TO: 1 x 4c x 4mm²
- (ii) CONTROL - CONNECTING DIRECTLY TO BK6 TERMINAL SUITABLE FOR TERMINATING UP TO 4mm²

3. EXHEAT INTERNAL CABLING:

- (i) 2.5mm² HIGH TEMP.
- (ii) 2.5mm² HIGH TEMP.

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IF YES, RECORD THE DCN No. IN THE COLUMN TO THE RIGHT.

DCN No	Y/N	REV	DATE	COMMENTS	DRWN	CHKD	APPR
1		19.09.16		MODEL NUMBER UPDATED (S)			PS
0		04.08.16		FIRST ISSUE			PS PB KP

3rd ANGLE PROJECTION	
DO NOT SCALE	
TOLERANCES UNLESS OTHERWISE STATED	
0	± 1.5mm
0.0	± 0.5mm
0.00	± 0.25mm
0.000	± 0.1mm
ANGULAR	± 2°

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED
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 FORMAT: AUTOCAD



TITLE	
FP4S-CS1-3.5-61-FS2-S0 WIRING DIAGRAM INDUSTRIAL PRODUCT	
EXHEAT DRAWING NUMBER	REV
028869.01.03	01