



**F.A.T.I.**  
Electric Heaters for Industry



MOD. CI/A4-0

**CLIENT: DELTA GMBH**  
**PO NUMBER: DELTA-FATI-2024-PO-200**  
**ITEM : RU0001A/B-H-01**  
**PROJECT: 2 KW**

F.A.T.I. Srl Società Unipersonale - CODICE FISCALE / PARTITA IVA IT00730220159 - CAPITALE SOCIALE € 500.000 - COD. MEC. MI021762 - REA MI339206 - SDI USA1.8PV



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Via A. Volta 52  
20047 Cusago (MI) Italy

Informativa ai sensi dell'art. 13 del Regolamento UE 679/2016. Vi informiamo che trattiamo i Vostri dati esclusivamente per la gestione del rapporto commerciale e la comunicazione avverrà a terzi che prendono parte al nostro processo aziendale unicamente per adempiere ad obblighi di legge, fini contrattuali, contabili. Potrete esercitare i vostri diritti rivolgendovi a F.A.T.I. S.r.l. via Volta, n°52 – 20047 Cusago (MI) oppure all'indirizzo e-mail: [privacy@fati.com](mailto:privacy@fati.com). Informazioni dettagliate sono riportate sul sito [www.fati.com](http://www.fati.com)



**F.A.T.I.**  
Electric Heaters for Industry



MOD. CI/A4-0

1. Test Report
2. Declaration of Conformity
3. Material Certificate 3.1
4. Certificate ITS 03 ATEX 11118X
5. Instruction & Maintenance Manual



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 <b>F.A.T.I.</b> Electric Heaters for Industry	<b>Project</b>		
	ELECTRIC HEATER 2 KW		
	<b>Title</b>	Test Report	<b>Rev.</b>
	<b>No.</b>	124990	0

## Test Report

<b>Client.:</b>	DELTA GMBH
<b>Purchase Order No.:</b>	DELTA-FATI-2024-PO-200
<b>Purchase Order Description:</b>	ELECTRIC HEATER
<b>Vendor Name:</b>	F.A.T.I. srl

0	07/10/2024	Issue for Approval	G. Morana	M. Borando	S. Tromba
<b>Rev.</b>	<b>Date</b>	<b>Revision Description</b>	<b>Prepared by</b>	<b>Checked by</b>	<b>Approved by</b>

CERT. NUM.: 241689 124990 - 2024



## CERTIFICATO DI COLLAUDO

### TEST CERTIFICATE

N°: 241689 124990 - 2024

CLIENTE / CUSTOMER : DELTA GMBH

NUMERO D'ORDINE / ORDER No.: DELTA-FATI-2024-PO-200

MATRICOLA / REG. NUMBER: 148B24-149B24

OGGETTO / Subject: Riscaldatore elettrico / Electrical heater

Item: RU0001A/B-H-01

Drawing: 240709EP01 R1

Date: 09/07/2024

#### CARATTERISTICHE ELETTRICHE / ELECTRIC CHARACTERISTICS

N° Riscaldatori / N° Heaters	2
Potenza nominale / Power rating	2 kW
Tensione nominale / Nominal voltage	400 V 3 fasi/phases
Corrente di linea / Current phase	2,9 A
Collegamento elettrico / Electric connection	Stella / Star
Carico superficiale / Max Watt Density (w/cm <sup>2</sup> )	2,1

#### COLLAUDI / TEST

Rigidità dielettrica Vx1' / Dielectric rigidity (PT003)	1800
Valore di Isolamento / Insulation value MΩ (PT002)	>5 Mega OHM
Controllo valore ohmico / Ohmic value check (PT001)	Positivo/Positive

**CERTIFICATO/CERTIFICATE ITS 03 ATEX 11118X Ex db IIB Gb**

Cusago (Milano)



**INSPECTION**  
Firma / Signature  
Deputy RQA  
**PAOLO MAPELLI**  
07 October 2024

Si certifica che il materiale descritto è stato prodotto e collaudato in accordo alle condizioni di contratto, salvo concessioni specificate e in accordo con le specifiche del nostro Sistema di Qualità. Questo certificato è conforme alla normativa UNI EN 10204 3.1.  
*We certify that material detailed hereon has been produced and inspected in accordance with the conditions and requirements of the contract or purchase order and unless otherwise noted conforms in all respects to the specification relevant thereto UNI EN 10204 3.1*



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CERT. NUM.: 241689 124990 - 2024

**VALORE OHMICO / Ohmic Value****PROCEDURA DI RIFERIMENTO / Ref. Procedure Nr.: PT001**

Stage	Ohmic value ref. (+/- 10%)	Test value	Satisfactory
#1	160,00	160,00 - 160,00	X

**TEST DI ISOLAMENTO / Insulation test****PROCEDURA DI RIFERIMENTO / Ref. Procedure Nr.: PT002**

Megger 1000V DC Insulation Ref. Value &gt; 5MΩ

SATISFACTORY	<input checked="" type="checkbox"/>
--------------	-------------------------------------

**TEST DIELETTRICO / Dielectric test****PROCEDURA DI RIFERIMENTO / Ref. Procedure Nr.: PT003**Pow. Diff. Phase / earth =  $950 + 1,2 V_n = 1800$  Test time: 1 min

SATISFACTORY	<input checked="" type="checkbox"/>
--------------	-------------------------------------

Cusago (Milano)



**INSPECTION**  
 Firma / Signature  
 Deputy RQA  
**PAOLO MAPELLI**  
 07 October 2024

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*We certify that material detailed hereon has been produced and inspected in accordance with the conditions and requirements of the contract or purchase order and unless otherwise noted conforms in all respects to the specification relevant thereto UNI EN 10204 3.1*



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CERT. NUM.: 241689 124990 - 2024



## RAPPORTO DI PROVA IDRAULICA HYDRAULIC TEST REPORT

CLIENTE CUSTOMER	DELTA GMBH		
DISEGNO DRAWING No.	240709EP01 R1	PROCEDURA PROCED.	FAT-HT01 rev.1
ITEM No.	RU0001A/B-H-01	P.O. No.	DELTA-FATI-2024-PO-200
NUM.REPORT REPORT No.	I-241689-124990	COMM. JOB No.	241689
SI CERTIFICA CHE IL MATERIALE È STATO SOTTOPOSTO A TEST IDRAULICO ALLE SEGUENTI CONDIZIONI SPECIFICATE, CON RISULTATO POSITIVO.  WE CERTIFY THE EQUIPMENT HAS BEEN HYDROSTATICALLY TESTED AT THE BELOW SPECIFIED CONDITIONS, WITH A POSITIVE RESULT.			
VALORE NOMINALE TEST PRESSIONE IDRAULICA: NOMINAL HYDRAULIC TEST PRESSURE VALUE:		35 bar(g) x 1 Hour	
VALORE TEST PRESSIONE IDRAULICA: HYDRAULIC TEST PRESSURE VALUE:		35 bar(g) x 1 Hour	
TEMPO TRASCORSO: ELAPSED TIME:		1h	
TEMPERATURA AMBIENTE: AMBIENT TEMPERATURE:		18°C	
NUMERO SERIE MANOMETRO: PRESSURE GAUGE S/N:		1A00PTNNX40	
RANGE PRESSIONE MANOMETRO: TEST PRESSURE GAUGE RANGE:		0-1000 digital	
REMARKS:.			
FATI	DELTA GMBH	THIRD PARTY INSPECTOR	
INSPECTION Firma / Signature Deputy RQA PAOLO MAPELLI 07 October 2024			


Si certifica che il materiale descritto è stato prodotto e collaudato in accordo alle condizioni di contratto, salvo concessioni specificate e in accordo con le specifiche del nostro Sistema di Qualità. Questo certificato è conforme alla normativa UNI EN 10204 3.1.

We certify that material detailed hereon has been produced and inspected in accordance with the conditions and requirements of the contract or purchase order and unless otherwise noted conforms in all respects to the specification relevant thereto UNI EN 10204 3.1

CERT. NUM.: 241689 124990 - 2024



## RAPPORTO DI VERIFICA VISIVA E DIMENSIONALE VISUAL AND DIMENSIONAL CHECK REPORT

CLIENTE CUSTOMER	DELTA GMBH		
DISEGNO DRAWING No.	240709EP01 R1	MATRICOLA Reg. Number	148B24-149B24
ITEM No.	RU0001A/B-H-01	P.O. No.	DELTA-FATI-2024-PO-200
NUM.REPORT REPORT No.	V-241689-124990	COMM. JOB No.	241689
<p>SI CERTIFICA CHE IL MATERIALE È STATO SOTTOPOSTO A CONTROLLO VISIVO E DIMENSIONALE ED È STATO DICHIARATO ACCETTABILE IN ACCORDO AL DISEGNO SOPRACITATO</p> <p>WE CERTIFY THAT THE MATERIAL HAS BEEN SUBMITTED TO VISUAL AND DIMENSIONAL TEST AND FOUND ACCEPTABLE IN ACCORDANCE WITH THE ABOVE MENTIONED DRAWING.</p>			
REMARKS:			
FATI	DELTA GMBH	THIRD PARTY INSPECTOR	
 INSPECTION Firma / Signature Deputy RQA PAOLO MAPELLI 07 October 2024			

Si certifica che il materiale descritto è stato prodotto e collaudato in accordo alle condizioni di contratto, salvo concessioni specificate e in accordo con le specifiche del nostro Sistema di Qualità. Questo certificato è conforme alla normativa UNI EN 10204 3.1.  
We certify that material detailed hereon has been produced and inspected in accordance with the conditions and requirements of the contract or purchase order and unless otherwise noted conforms in all respects to the specification relevant thereto UNI EN 10204 3.1



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	<b>Project</b>		
	ELECTRIC HEATER 2 KW		
	<b>Title</b>	Declaration of Conformity	<b>Rev.</b>
	<b>No.</b>	124990	0

## Declaration of Conformity

<b>Client.:</b>	DELTA GMBH
<b>Purchase Order No.:</b>	DELTA-FATI-2024-PO-200
<b>Purchase Order Description:</b>	ELECTRIC HEATER
<b>Vendor Name:</b>	F.A.T.I. srl

0	07/10/2024	Issue for Approval	G. Morana	M. Borando	S. Tromba
<b>Rev.</b>	<b>Date</b>	<b>Revision Description</b>	<b>Prepared by</b>	<b>Checked by</b>	<b>Approved by</b>

CERT. NUM.: 241689 124990 - 2024



## DICHIARAZIONE UE DI CONFORMITÀ

EU DECLARATION OF CONFORMITY

Noi / We

**F.A.T.I. s.r.l.**

**Fabbrica Apparecchiature Termoelettriche Industriali**

**Via Volta, 52 – 20047 CUSAGO (MI) - ITALIA**

dichiariamo sotto la ns. responsabilità che / declare under our own responsibility that

il riscaldatore elettrico Tipo <i>the electric heater Type</i>	<b>100/D</b>
con modo di protezione <i>with type of protection</i>	<b>Ex db IIB T3 Gb</b>
matricola n. <i>serial number</i>	<b>148B24-149B24</b>
è conforme alle Norme <i>complies with the Standards</i>	<b>EN IEC 60079-0: 2018 EN 60079-1: 2014</b>
ed alla direttiva europea <i>and with the european directive</i>	<b>2014/34/UE</b>
per il gruppo e la categoria <i>for group and category</i>	<b>II 2G</b>
Certificato di esame UE del tipo <i>EU type examination certificate</i>	<b>ITS 03 ATEX 11118 X</b>
rilasciato dall'Organismo Notificato <i>issued by the Notified Body</i>	<b>INTERTEK Italia (O.N. n. 2575)</b>
O.N. incaricato della sorveglianza <i>N.B. in charge for surveillance</i>	<b>CESI (O.N. n. 0722)</b>



### INSPECTION

Firma / Signature

Deputy RQA

**PAOLO MAPELLI**

**07 October 2024**

Firma / signature Deputy RQA

Data / date: **07/10/2024**

La presente Dichiarazione si compone di 2 pagine / This Declaration is composed by 2 pages



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CERT. NUM.: 241689 124990 - 2024



**F.A.T.I. s.r.l.**  
dichiara inoltre che  
il prodotto  
**“RISCALDATORI ELETTRICI IN GUAINA METALLICA”**  
*furthermore declares that  
the product*  
**“METAL SHEATHED ELECTRIC HEATERS”**

**è CONFORME** alle disposizioni  
della seguente direttiva:  
**2011/65/UE “RoHS” (nota come RoHS II) +  
Direttiva Delegata (UE) 2015/863 (RoHS III)**  
*is in accordance with the provisions  
of the following directive:  
2011/65/EU “RoHS” (known as RoHS II) +  
Commission Delegated Directive (EU) 2015/863 (RoHS III)*

**e che il prodotto in oggetto,  
destinato ad essere utilizzato  
in atmosfera potenzialmente esplosiva,  
è escluso dal campo di applicazione  
della direttiva 2014/35/UE “BASSA TENSIONE”**  
*and that the above product,  
intended for use  
in potentially explosive atmosphere,  
is out of the scope  
of the directive 2014/35/EU “LOW VOLTAGE”*



**INSPECTION**  
Firma / Signature  
Deputy RQA  
**PAOLO MAPELLI**  
07 October 2024

Data / date: 07/10/2024Firma / signature Deputy RQA

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 <b>F.A.T.I.</b> Electric Heaters for Industry	<b>Project</b>		
	ELECTRIC HEATER 2 KW		
	<b>Title</b>	Material Certificate 3.1	<b>Rev.</b>
	<b>No.</b>	124990	0

## Material Certificate 3.1

<b>Client.:</b>	DELTA GMBH
<b>Purchase Order No.:</b>	DELTA-FATI-2024-PO-200
<b>Purchase Order Description:</b>	ELECTRIC HEATER
<b>Vendor Name:</b>	F.A.T.I. srl

0	07/10/2024	Issue for Approval	G. Morana	M. Borando	S. Tromba
<b>Rev.</b>	<b>Date</b>	<b>Revision Description</b>	<b>Prepared by</b>	<b>Checked by</b>	<b>Approved by</b>



SATINOX ACCIAI S.R.L.

Sede Legale: Via Pasubio,7 - 21049 Tradate(VA)

Sede Operativa: Viale Europa, Est 61 - 21010 Cardano al Campo (VA)

C.F. e P.IVA: IT08249050967

R.E.A.: VA 345943 Cap.Soc.: €10000 i.v.

Tel. 0331.701826 - Fax. 02.87163563

www.satinoxacciai.it - commerciale@satinoxacciai.it

Pec: amministrazione@pec.satinoxacciai.it - Codice Dest.: T04ZHR3

<b>Certificato di Conformita' 3.1</b>	Certificato	6197 2023	del	02/10/2023
	DDT nr°	3179	del	02/10/2023

<b>Cliente</b>	FABBRICA APPARECCHIATURE TERMOELETTRICHE INDUSTRIA		
Rif Vs ordine:	Vs.Ordine 1202 del 26/08/2023	Ns ordine nr.	2023/3377

**DESCRIZIONE PRODOTTO:**

Tubo eu EN 1.4307 10 x 1 EN 10217-7 TC1 L.com.

<b>QUANTITA'</b>	<b>MT 3060,00</b>	<b>COLATA</b>	<b>0547743</b>
Tolleranze spessore secondo ASTM A249 Classe: A tampone		Tubo prodotto secondo normativa ASME SA249	
Marcatatura : Come da norma	Tolleranza Lunghezza : - 0 / +10 mm	Laminazione : si	

**Risultati delle prove :**

lotto	Classe Prova	Prova di trazione in Nmm <sup>2</sup> =Mpa				Durezza Hrb
		Snervamento rp0,2 > 180	Snervamento rp1,0 > 215	Carico di rottura rm 470 - 670	Allungamento A% > 240	
	TC1	Conforme	Conforme	Conforme	Conforme	Conforme
	V=1	Conforme	Conforme	Conforme	Conforme	Conforme

**Composizione chimica della colata :**


<b>Colata: 0547743</b>								
C 0,00-0,03 Conforme	Mn 0,00-2,00 Conforme	P 0,00-0,045 Conforme	S 0,00-0,015 Conforme	Si 0,00-1,00 Conforme	Cr 17,50-19,50 Conforme	Ni 8,00-10,00 Conforme	Mo	N 0,00-0,11 Conforme

I valori chimici si riferiscono al certificato rilasciato dall'acciaieria secondo le norme EN 10088 /10028-7 / ASTM A240 e archiviati presso la ns sede.

	Test	Risultato		Test	Risultato
Prova di trazione ASME SA249	X	OK	Test eddy current ASME SA249	X	OK
Prova di schiacciamento ASME SA249	X	OK	Processo di lavorazione	AOD	OK
Prova a flangia ASME SA249	X	OK	Controllo identificazione materiale	X	OK
Esame visivo ASME SA249	X	OK			
Esame dimensionale ASME SA249					

Il presente documento riporta fedelmente i dati fornitici

SATINOX ACCIAI srl

	<b>Project</b>		
	ELECTRIC HEATER 2 KW		
	<b>Title</b>	Cerificate ITS 03 ATEX 11118X	<b>Rev.</b>
	<b>No.</b>	124990	0

## Cerificate ITS 03 ATEX 11118X

<b>Client.:</b>	DELTA GMBH
<b>Purchase Order No.:</b>	DELTA-FATI-2024-PO-200
<b>Purchase Order Description:</b>	ELECTRIC HEATER
<b>Vendor Name:</b>	F.A.T.I. srl

0	07/10/2024	Issue for Approval	G. Morana	M. Borando	S. Tromba
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# EU TYPE-EXAMINATION CERTIFICATE

1. EU type-examination Certificate (Module B)
2. Equipment or Protective System intended for use in potentially explosive atmospheres (Directive 2014/34/EU)



3. EU type examination certificate Nr **ITS03ATEX11118X**

4. **Product:** SERIES 0 TO 450/D IMMERSION HEATERS

5. **Manufacturer:** F.A.T.I. S.r.L.

6. **Address:** Via Volta, 52  
20090 Cusago (MI) - Italy

7. This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.
8. INTERTEK ITALIA S.p.A., Notified Body n° 2575 in accordance with article 17 of the Directive 2014/34/EU of the European Parliament and Council of the 26 February 2014, certifies that the equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmosphere, given in Annex II of the Directive.  
  
The examination and tests results are recorded in confidential technical evaluation Intertek Report Ref. 02009398 Issue 1 dated April 2003, Report 07028108 Issue 1 dated May 2008, Report G100999171 Issue 1 dated February 2013, Report 200027079UDI-ATX dated 30 September 2020.
9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with standards EN IEC 60079-0:2018 and EN 60079-1:2014, except in respect of those requirements referred to at item 16 of the Schedule.
10. If the sign X is placed after the certificate number, it indicates that the product is subject to Special Conditions for Safe Use specified in the schedule to this certificate.
11. This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12. The marking of the product shall include the following:



II 2G Ex db IIB T6-T1 or T\*Special Gb (see schedule)

-60°C ≤ Ta ≤ +60°C or

-50°C ≤ Ta ≤ +60°C

October 1, 2020

Certificate issue date



**Alessandro Savio**  
Certification Officer  
Intertek Italia S.p.A. (NB 2575)



PDR N° 277B

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC

Signatory of EA, IAF and ILAC Mutual Recognition Agreements



This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

**Intertek Italia S.p.A.** Via Miglioli, 2/A - 20063 Cernusco sul Naviglio, Milano - Italy



## SCHEDULE

EU TYPE EXAMINATION CERTIFICATE NUMBER: ITS03ATEX11118X

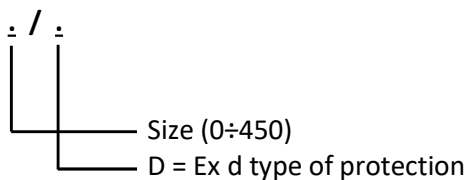
### 13. DESCRIPTION OF THE EQUIPMENT OR PROTECTIVE SYSTEM

The heaters series 0÷450/D are designed to heat a wide range of liquid and gases.

The heating elements consist typically of a nickel chrome spiral, centred in a metal tube, and insulated with magnesium oxide, and can be attached to plates or flanges by various means.

The element is reduced in diameter after filling with Magnesium oxide, and then can be formed into various shapes.

#### Identification code:



The surface loading of the elements in the heater is determined by the thermal characteristics of the fluid or gas being heated, and its operating temperature and pressure.

For Thyristor control normally the heater is wired up for one stage, but on the larger loads the multiple thyristor stages can be used.

A *stage* is a group of interconnected heating elements, powered by a single, or multiple cables (single-phase or three-phase), for example, a heater of 100 kW, 380V three-phase, *three stages*, could be powered by 3 *three-phase* cables, permitting the switching of one, two or three stages depending on the power required to maintain the process temperature.

#### Ratings

Maximum Voltage	: 750 Vac
Total Maximum power	: 2000 kW
Rated Frequency	: 50/60 Hz

Minimum and maximum plant operating temperature: -200°C to +650°C (temperature class T6 or T5 or T4 or T3 or T2 or T1 or T\*Special from +401°C to +650°C).

For the purposes of this certificate, the “*Maximum plant operating temperature*” is the Outlet temperature of the fluid (either liquid or gas), which is controlled through the control system. A High temperature safety cut-out device, which can be a thermostat, thermocouple or resistance thermometer installed by FATI, is incorporated in every heater supplied. It is also recommended that a high surface temperature cut-out is fitted to the apparatus at the point of highest surface temperature. All safety cut-out devices conform to the requirements of EN 60730 standard.

The assigned temperature class is based on the maximum plant operating temperature.

The Immersion heaters can be optionally provided with a Reset push-button, to operate from outside the manual reset thermostat, without de-energizing the heater nor opening the terminal box. Identification of this version is traceable through the serial number of the product.



## SCHEDULE

### EU TYPE EXAMINATION CERTIFICATE NUMBER: ITS03ATEX11118X

The heaters series 0÷450/D are designed to operate within the following ambient temperature range, depending on the type of reset push-button provided:

Reset push-button	Ambient temperature range
Not provided	-60°C to +60°C
Provided – DP3 or RS1P Type	-50°C to +60°C
Provided – PM10X Type	-60°C to +60°C

CE Marking shall be accompanied by the identification number of the Notified Body responsible for surveillance of production.

#### 14. DRAWINGS AND DOCUMENTS

TITLE	DOCUMENT Nr	LEVEL	DATE
ELECTRIC HEATERS SERIES 0÷450/D – CE Ex II 2G Ex db IIB T6/T1 + T Special Gb (Sheets 1-3)	30409	3	14-04-2020
Technical Description	30409/NT	4	21-07-2020
Installation, Operation and Maintenance Instructions for FATI flame-proof industrial immersion heaters	30409/IS	3	14-04-2020

Copies of the above listed documents are kept at Intertek Italia S.p.A. archive.

#### 15. SPECIAL CONDITIONS FOR SAFE USE

- The dimensions of flameproof joints are different from the values specified in the tables of the standard EN 60079-1. The flameproof joints are not intended to be repaired by other than F.A.T.I. Srl, or its approved agent.
- The screws used for the assembly of the various parts of flameproof enclosures shall be of quality higher or equal to 12.9.

#### 16. ESSENTIAL HEALTH AND SAFETY REQUIREMENTS


The relevant essential Health and Safety Requirements have been identified and assessed in Intertek Report Ref. 02009398 Issue 1 dated April 2003, Report 07028108 Issue 1 dated May 2008, Report G100999171 Issue 1 dated February 2013, Report 200027079UDI-ATX dated 30 September 2020.

#### 17. ROUTINE (FACTORY) TESTS

- A routine overpressure test in accordance with EN 60079-1:2014 Clause 16.1 shall be carried out on all enclosures, at a pressure of 18 bar for a period of between 10 and 60 seconds. There shall be no deformation or damage to the enclosures and no leakage through the walls of the enclosure. Integrity of the welded construction shall also be verified during routine overpressure testing. Details must be recorded, and records maintained.

#### 18. DETAIL OF CERTIFICATE CHANGES

None.

	<b>Project</b>		
	ELECTRIC HEATER 2 KW		
	<b>Title</b>	Instruction & Maintenance Manual	<b>Rev.</b>
	<b>No.</b>	124990	0

## Instruction & Maintenance Manual

<b>Client.:</b>	DELTA GMBH
<b>Purchase Order No.:</b>	DELTA-FATI-2024-PO-200
<b>Purchase Order Description:</b>	ELECTRIC HEATER
<b>Vendor Name:</b>	F.A.T.I. srl

0	07/10/2024	Issue for Approval	G. Morana	M. Borando	S. Tromba
<b>Rev.</b>	<b>Date</b>	<b>Revision Description</b>	<b>Prepared by</b>	<b>Checked by</b>	<b>Approved by</b>

**Installation, Operation and Maintenance**  
**Instructions for F.A.T.I. Flameproof Industrial**  
**Immersion Heaters**

**n. 30409/IS**

Rev. 3 dated 14/04/2020

**Series 0 ÷ 450/D**

**CE  II 2G**

Ex db IIB T6 ÷ T1 *or* T special (°C) Gb


Directive 2014/34/EU

Standards

EN 60079-0

EN 60079-1

**Marking (example of Label)**

F.A.T.I. s.r.l. – Cusago (MI) – ITALY
Heater type 150/D    S/N: .....
.... V    ... A    .... kW    .. Hz
Stages: nr. .... Year of construction: ....
<b>CE 0722  II 2G Ex db IIB T. Gb</b>
ITS 03 ATEX 1118X    Ta: -60 ÷ +60°C
<b>Supply with cable suitable for t ≥ °C</b>
Cable entries: <b>ISO Mx1.5</b> <input checked="" type="checkbox"/> <b>NPT</b> <input type="checkbox"/>
For size & quantity see Instructions for Use
<b>Use only screws of quality at least 12.9</b>
<b>DO NOT OPEN WHILE ENERGIZED IF AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT</b>

## INDEX

- 1.0 General instructions and characteristics**
- 2.0 Installation Instructions**
- 3.0 Putting into operation**
- 4.0 Maintenance**
- 5.0 Special conditions for safe use**

### **1.0 General instructions and characteristics**

- 1.0.1 The heater should be carefully removed from its packing and inspected for any physical damage which may have occurred during transit.
- 1.0.2 The heater should be stored in a warm dry atmosphere until installed, and when installed the terminal box and cable entries are sealed against the ingress of moisture. If long term storage is envisaged, then it is recommended that, where heaters have anti condensation heaters fitted, they are energised whilst the heater remains in storage.
- 1.0.3 The heater must only be immersed in the fluid it is designed for, and any alternative fluid, or change in concentration of the fluid, may cause damage to the heater and would invalidate the guarantee.
- 1.0.4 All current regulations, standards, and recommendations must be complied with at the time of installation and operation.
- 1.0.5 Please refer to **EN 60079-14** for the regulations concerning installation, and to **EN 60079-17** for the regulations concerning maintenance.
- 1.0.6 The flameproof terminal box has accurately machined threads and surfaces and care must be taken to prevent these surfaces being damaged.
- 1.0.7 The cover is fitted with **screws of quality 12.9**: when substitution should be required, **ONLY** screws of the same quality or better may be used. Please contact the manufacturer for replacement screws.

**WARNING: When the Heater is installed / used in corrosive environments (like, for example, desert or marine environments), the “housing” of each cover screw should be filled with a specific protective grease (see 4.6 at page 5).**

### **1.1 General characteristics**

Type of protection:	<b>Ex db IIB T6 ÷ T1 or T special (°C) Gb</b>
Degree of protection:	<b>IP 65</b>
ATEX code:	<b>II 2G</b>
Maximum voltage:	750 V
Maximum current:	unlimited
Maximum power:	2000 kW
Rated frequency:	50/60 Hz
Ambient temperature range:	- 60 to + 60°C (- 50°C to + 60°C if push-button type RS1P or DP3 is mounted)
Plant operating temperature range:	- 200°C to 600°C

## 2.0 Installation Instructions

- 2.0.1 The installation should be carried out by suitably qualified personnel.  
**WARNING: before to install cable / conduit devices, verify type of thread, indicated on the label, and dimensions reported on the attached Test Certificate.**

Attached document (Test Certificate)	Signature
<b>241689 124990 - 2024</b>	<b>MI</b>

- 2.0.2 All electrical tests must be carried out in a safe area, not in the hazardous area.
- 2.0.3 Verify that any special conditions for safe use, detailed on the ATEX certification, are complied with.
- 2.0.4 When refitting the cover, ensure that all the joint surfaces are clean and free of any debris, and the O ring seal is in good condition.
- 2.0.5 Check that the heater supplied is suitable for the specific hazardous area classification (Zone 1 or Zone 2, gas group IIA or IIB).  
**WARNING: the Heater is NOT suitable for zone 0.**
- 2.0.6 Verify that the temperature class marked on the heater is correct for the area classification.

### 2.1 **Connection to the electrical supply**

- 2.1.1 Verify that the electrical supply corresponds with the supply specified on the heater rating plate and the wiring diagram.
- 2.1.2 Check that the incoming supply cables are of the correct size and type for the load and the temperature of the heater.
- 2.1.3 **The heater power circuit must be protected by a suitably rated over current device.**
- 2.1.4 The cables used to connect this heater must be suitable for hazardous area installation, *for the temperature stated on the heater's label*, and be connected via **ATEX certified Ex d** cable glands.
- 2.1.5 Thermostat and high temperature safety cut-outs must be connected using **ATEX certified Ex d** cable glands.
- 2.1.6 Where a cable entry in a terminal box needs to be reduced in size, suitable for a smaller cable gland size to be fitted or where a different thread form is required, a suitable **ATEX certified Ex d** adapter must be used.
- 2.1.7 In alternative to the *Cable entry system*, a *conduit system* can be used to protect wiring and to enter into the terminal compartment of the heater: in this case, suitable **ATEX certified Ex d** devices and components must be used at each entry point (sealing fittings, 3 pieces unions, adapters, etc.).
- 2.1.8 The incoming cables must be connected to the heater terminals provided by F.A.T.I. **Do not alter any factory fitted wiring.**
- 2.1.9 The control and high temperature safety cut-out cables must be installed using the correct colour coded cables.

- 2.1.10 Before energizing the heater for the first time, ensure that the insulation resistance is at least 2 MΩ.

## 2.2 **Warning: the Heater must be earthed**

- 2.2.1 The heater is supplied with two earth points: one is located externally and the other is located inside the terminal box.
- 2.2.2 After connection check the continuity of earth connections.

## 3.0 **Putting into operation**

- 3.1 Before energizing the heater, ensure that the heating elements are fully immersed in the fluid to be heated. **If the fluid is a hazardous gas ensure the heating system is purged and oxygen free before energizing the heater.**
- 3.2 Check the operation of the safety trips fitted.
- 3.3 **If heating liquid in a tank,** ensure that level controls are fitted, that the low level safety cut-off is independent of the level control, and **a minimum level of liquid of at least 50 mm, above the highest part of the heater, is guaranteed.**
- 3.4 All safety trips, including the high temperature safety cut-out, must be wired directly to a back-up contactor and must not be wired through a DCS system.
- 3.5 Where a manual reset safety cut-out is fitted in the heater terminal box the heater must be de-energized before removing the terminal box cover and resetting the safety trip. It is recommended that its operation is checked before energizing for the first time.
- 3.6 where the heater has a thermocouple, RTD, PTC or NTC high temperature safety trip system, the remote instrument must be fail-safe and comply with the latest regulations. **WARNING: where temperature sensible devices are protected by Intrinsically Safe Associated Apparatus (normally called Safety Barriers), the relevant cables must be installed, and checked, according to the Intrinsic Safety specific regulations.**
- 3.7 upon start up for the first time it is recommended that the remote high temperature safety cut-out instrument set point is adjusted to trip the heater when the heater has reached its normal operating temperature and set 10-20 °C above to avoid spurious tripping.
- 3.8 It is important that all start up and operating procedures that are specified with any control panel feeding the heater are strictly followed.

## 4.0 **Maintenance**

- 4.1 All maintenance operations should be in accordance with EN 60079-17 (Table 1).
- 4.2 All existing site safety regulations must be followed at all times.
- 4.3 Ensure that before any maintenance is carried out, there are no hazardous gases present.

- 4.4 The heater must be fully de-energized before any work is carried out.
- 4.5 The heater should be subject to a regular maintenance schedule with the following actions as a minimum:
- Check that the heating elements are clean and free from any deposits.
  - Check the continuity and insulation resistance at least 2 MΩ.
  - The internal wiring shall be clean and dry, with no apparent deterioration of the wiring insulation.
  - All connections shall be tight, without signs of overheating
  - On heaters with multiple elements check the resistance against the figures recorded at first installation to indicate if there is an individual element failure.
  - When refitting the terminal cover, ensure the gasket is in good condition or replace it.
- 4.6 **How to maintain the resistance of the cover screws when the Heater is installed / used in corrosive environments (see 1.0.7, at page 2):**  
**Corrosion inhibiting grease, such as petrolatum or soap-thickened mineral oils, should be applied to the cover screw heads after assembly (filling the relevant “housings”). The grease, if applied, shall be of a type that does not harden because of ageing, does not contain an evaporating solvent, and does not cause corrosion on the screw surface. Verification of suitability shall be in accordance with the grease manufacturer’s specification (see also EN 60079-1, § 5.1).**

**WARNING:**

**Visually inspect at least once a year the condition of the cover screws: if they are protected by suitable grease, it’s enough, for the purpose, to “clean” a couple of (diametrically opposed) screws; in case of doubt, remove them and carry out a detailed inspection on both screws. If they are affected by corrosion, ALL screws shall be replaced.**

**Note: The replacement of any metal-sheathed heating element (*or reset push-button, if present*) must only be carried out by F.A.T.I. Srl, or its approved agent, to maintain a valid certification. Any modification or replacement carried out by the installer, or the end user, will invalidate the certification.**

## **5.0 Special conditions for SAFE USE**

The screws used for the assembly of the various parts of flameproof enclosure must be of quality 12.9 or higher.

**The dimensions of flameproof joints are different from the values specified in the tables of EN 60079-1 standard. The flameproof joints are not intended to be repaired by other than F.A.T.I. Srl, or its approved agent.**



FABBRICA APPARECCHIATURE TERMOELETTRICHE INDUSTRIALI

# Electric Industrial Heaters

## General Instructions for Installation, Operation and Maintenance

(Rev. 2 10/05/2022)



## F.A.T.I.

**ELECTRIC HEATERS FOR INDUSTRY**

Via VOLTA n° 52 - 20090 - CUSAGO (MI)

Phone 0039-02-90119641

Fax 0039-02-9019548

e-mail: [info@fati.com](mailto:info@fati.com)

website: [www.fati.com](http://www.fati.com)

## IMPORTANT

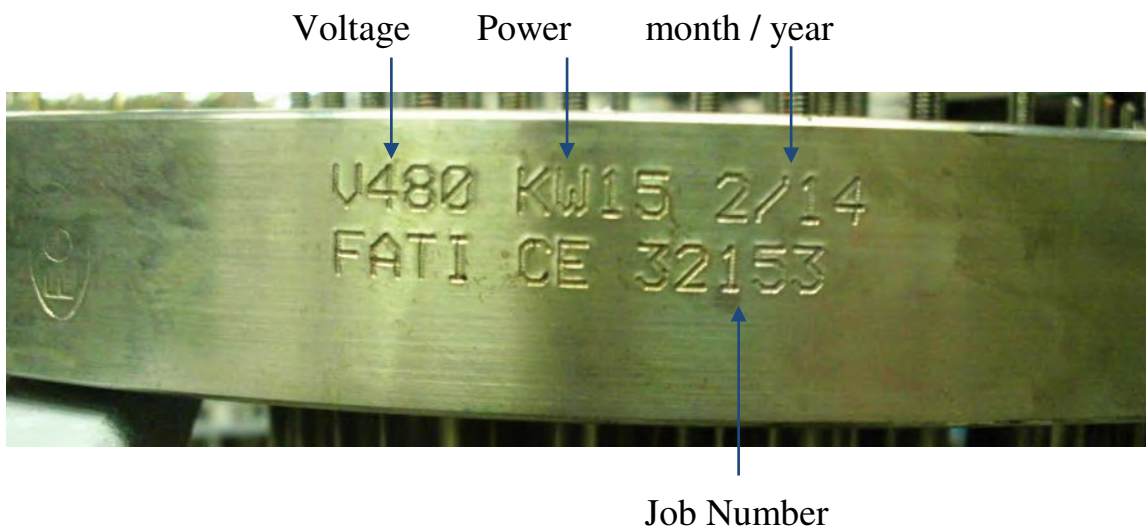
**In case you need help from the factory, please make always reference to the following heater's data (marking):**

- 1) – date of construction (month / year),
- 2) – electrical data (Voltage and Power),
- 3) – Job Number, and,  
in case of Ex Heaters (ATEX, IECEX, GOST, INMETRO, PESO, Etc.):
- 4) – full Type Code and Serial Number.

**In case you have not purchased the Heater directly from FATI, please give us the name of your Supplier.**

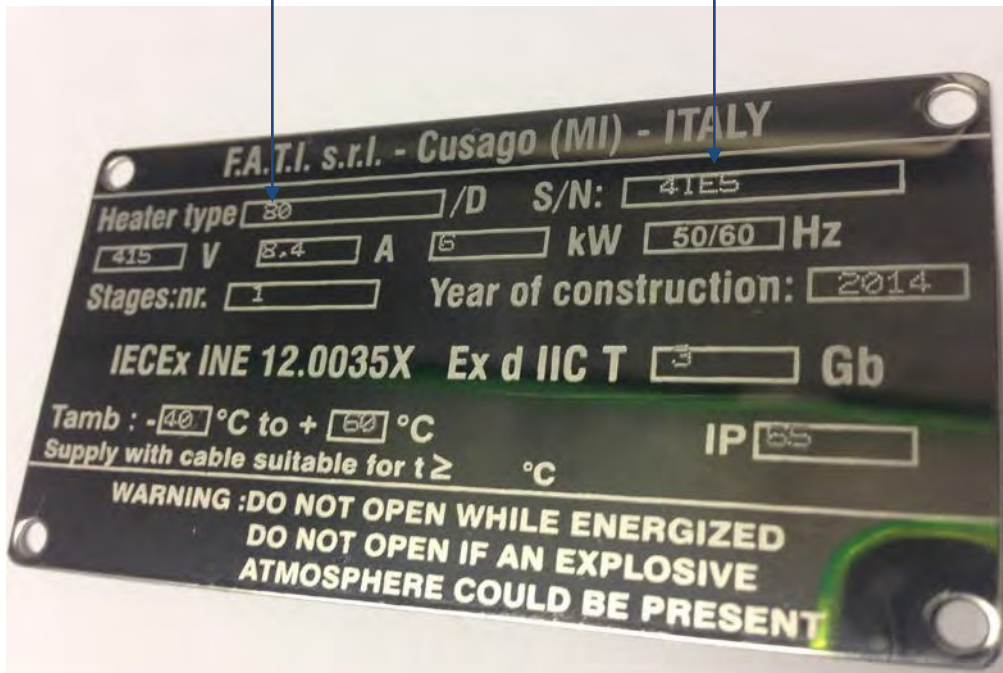
### Example of marking

(generally engraved on the heater's flange)



Type Code

Serial Number



### WARNING

**If you are installing or operating Ex Heater, please read carefully the specific Instructions attached.**



## GENERAL INDEX

1. **Handling and Storage**
2. **Installation**
3. **Start-up and Operation**
4. **Maintenance**
5. **Responsibility**
6. **Electrical data**

### 1. **Handling and Storage**

This heater has been manufactured using high quality materials and should be stored in a warm dry environment as befits all electrical equipment; it should not be stored in a humid or damp atmosphere.

In the event that, mainly for medium to large size heaters, a long-term storage is envisaged, it is strongly recommended that:

- where an anti-condensation heater (or trace heating cable) is fitted inside the heater terminal box, it's energized whilst the heater is stored; otherwise
- adequately protect the heater, creating around it a provisional warm dry *room*.

### 2. **Installation**

The installation of electric heaters / heating systems shall be done according to the national laws and/or standards of the country where they are intended to be used; in case of lack of national regulations, international standards series IEC 60519 should be followed.

- 2.1. Verify that the electrical supply corresponds with the supply specified on the heater rating plate.
- 2.2. Check that the incoming supply cables are the correct size for load carried under normal and possible abnormal conditions.
- 2.3. Ensure that the heater is correctly earthed.
- 2.4. Ensure that the heater is connected in accordance with the element wiring diagram, and that all connections are tight, as loose connections will overheat and cause failure.
- 2.5. Check that all control cables for high temperature trips are correctly installed with correct colour coding.
- 2.6. Before energizing the heater for the first time, carry out an electrical check to ensure that the insulation to earth is higher than the minimum of 1 M $\Omega$  per element at 500 Volts.
- 2.7. A continuity check should be carried out to confirm that the ohms per phase are approximately equal and the readings recorded.
- 2.8. If when carrying out the insulation check a reading of less than 1 M $\Omega$  per element is found then it will be necessary to dry the elements out. We recommend that the procedures below are followed.
  - a) Remove the heater bundle and put it in a heat source (oven) at 150 – 200 °C for at least 8 hours or until the insulation values are restored.
  - b) If the heater cannot be removed, connect the heater to a low voltage supply and heat the elements up to 150 °C minimum and maintain until the insulation values are restored.

2.9. *If inside the electric heater a thermostat is present, and if not wired in series to it, the thermostat shall be connected by an expert Electrician, under the supervision of the Plant Manager. The thermostat, if already set by F.A.T.I., must not be “RECALIBRATED”, under penalty of loss of the guarantee (mostly if the equipment is intended for use in potentially explosive atmosphere). We remember you that the thermostat is mounted inside a pocket, placed at 10/15 mm from the heating element, than the operation temperature is influenced by:*

*a) distance of the thermowell from the element;*

*b) position of the thermowell (central or peripheral: in the last case, the sensibility of the thermostat is influenced by its position with respect to the elements, which, in base to the mounting, may be: lateral, upper, lower).*

*When an ambient thermostat is installed outside the electric duct heater, after setting according to User requirements, it also shall be wired in series to the heater, or, in any case, connected in such a way to switch-off the heater when opening. It is NOT a safety cut-out.*

3.0. ATTENTION: *Standoffs (if any) and Junction Box shall not be lagged.*

### **3. Start up and Operation**

Before energizing the heater ensure the heating elements are fully immersed, or gas or fluid is flowing through the heater. Safety trips should be set initially at a low temperature, so that they are checked for operation before normal working temperature is reached.

When it is confirmed that the safety trips are operative the heater can be run up to its normal operating temperature and safety trip adjusted to just trip the heater, record this temperature and set trip temperature at 10 - 20 °C above, to avoid spurious tripping but ensuring that any malfunction which results in an abnormal rise in element temperature will quickly trip the heater.

It is important that all start up and operating procedures that are specified with the control panel or switchboard are followed.

### **4. Maintenance**

The heater should be checked periodically that the heating elements are clean and free from any deposits, together with continuity and insulation resistance. On heaters with a number of elements it is likely that a single element failure is not noticeable from a temperature control viewpoint, and a resistance check is the only way to indicate an individual element failure, therefore it is advisable to record the resistance of each section of each phase. If a significant increase has occurred, it is likely that an element has failed.

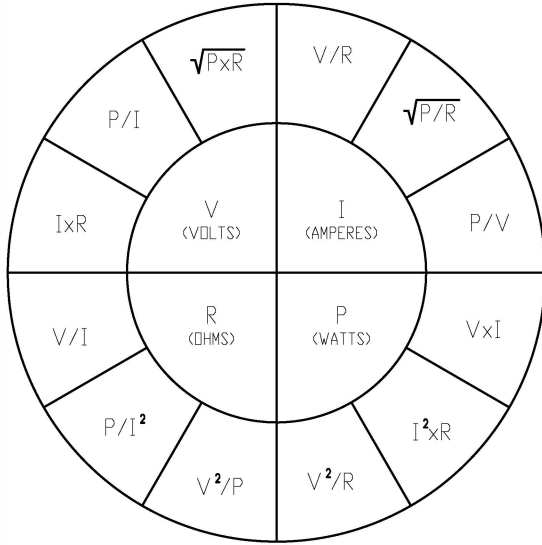
### **5. Responsibility**

The company (F.A.T.I. S.r.l.) will not accept any responsibility, and any guarantee will be invalidated, if modification(s) to the heater is(are) made without its approval, and the installation and operation is not carried out by suitably qualified personnel.

*Heater-disposal : the electrical heater is made up of materials such as carbon steel, stainless steel, special steel and completely recyclable materials, it must be disposed of at raw material recyclers.*

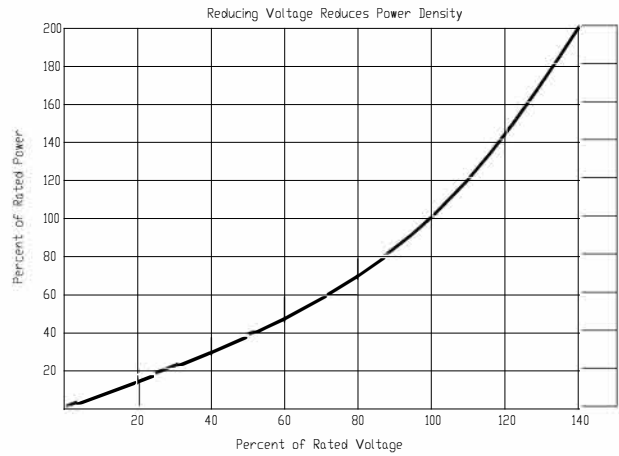
# 6. Electrical Data

## OHM'S LAW



PERCENT RATED POWER ON REDUCED VOLTAGE		
230 V	heater on 208 V	82%
240 V	heater on 208 V	75%
480 V	heater on 277 V	33%
480 V	heater on 440 V	84%
480 V	heater on 318 V	44%
550 V	heater on 480 V	76%

## Power Change with Voltage Change



$$P_2 = P_1 \times (V_2/V_1)^2$$

Where:

$P_2$  = New power output

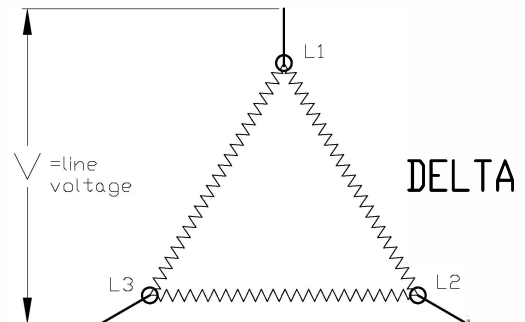
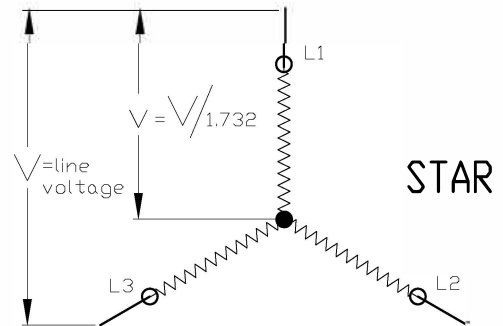
$P_1$  = Rated power

$V_2$  = Applied voltage

$V_1$  = Rated voltage

CURRENT CONVERSION TABLE						
Power (W)	Voltage (V) Single Phase			Voltage (V) 3 ph. Balanced Load		Power (W)
	120	240	480	240	480	
100	0,83	0,42	0,21	0,24	0,13	100
150	1,25	0,63	0,31	0,36	0,18	150
200	1,67	0,83	0,42	0,49	0,25	200
250	2,08	1,04	0,52	0,61	0,30	250
300	2,50	1,25	0,63	0,73	0,37	300
350	2,92	1,46	0,73	0,85	0,43	350
400	3,33	1,67	0,84	0,97	0,49	400
450	3,75	1,88	0,93	1,10	0,55	450
500	4,17	2,08	1,04	1,20	0,60	500
600	5,00	2,50	1,25	1,45	0,73	600
700	5,83	2,92	1,46	1,70	0,85	700
800	6,67	3,33	1,67	1,93	0,97	800
900	7,50	3,75	1,87	2,17	1,09	900
1000	8,33	4,17	2,10	2,41	1,21	1000
1100	9,17	4,58	2,30	2,65	1,33	1100
1200	10,00	5,00	2,51	2,90	1,45	1200
1250	10,40	5,21	2,61	3,10	1,55	1250
1300	10,80	5,42	2,71	3,13	1,57	1300
1400	11,70	5,83	2,91	3,38	1,69	1400
1500	12,50	6,25	3,12	3,62	1,82	1500
1600	13,30	6,67	3,34	3,86	1,93	1600
1700	14,20	7,08	3,54	4,10	2,05	1700
1800	15,00	7,50	3,75	4,34	2,17	1800
1900	15,80	7,92	3,96	4,58	2,29	1900
2000	16,70	8,33	4,17	4,82	2,41	2000
2500	20,80	10,40	5,21	6,10	3,05	2500
3000	25,00	12,50	6,25	7,23	3,62	3000
3500	29,20	14,60	7,30	8,45	4,23	3500
4000	33,30	16,70	8,33	9,64	4,82	4000
5000	41,70	20,80	10,42	12,10	6,10	5000
6000	50,00	25,00	12,50	14,50	7,25	6000
7000	58,30	29,20	14,59	16,90	8,50	7000
8000	66,70	33,30	16,67	19,30	9,65	8000

## THREE PHASE CIRCUITS



If elements are designed for 3-phase Delta connection, power output may be reduced to 1/3 by reconnecting to 3-phase STAR

Current in 3-phase circuits  $I = \frac{P}{(V \times 1.732)}$

Resistance in 3-phase circuits (across any two terminals)

$$R = \frac{V^2}{1/2 \times P}$$