

Installation electric air heater TBCE/TBRE/TCLE-02 GOLD/COMPACT/SILVER C

1. General

Air heater TBCE/TBRE is used for reheating of the supply air or for certain preheating needs of outdoor air.

Air heater TBCE/TBRE/TCLE is available in several capacity variants.

The electrical equipment conforms to the provisions of Degree of Protection IP44.

The air heater is approved for operating temperatures, in the surroundings and the air stream, from -25°C to +40°C.

Storage temperature from -40°C to +70°C.

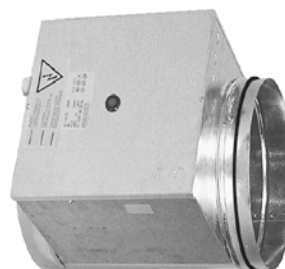
GOLD:

Requires Program Version 1.22 or a later version.

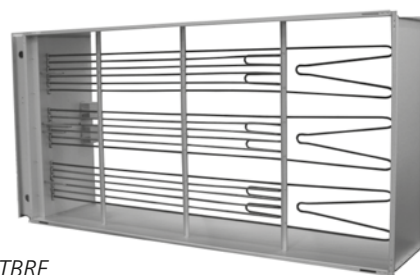
2. Maintenance

Installations with electric air heaters are sensitive to variations in the airflow. Filters and electric air heaters should be inspected often to see if filter replacement and cleaning is necessary.

Electric air heaters should only be cleaned by vacuum cleaning, brushing with a soft brush or using compressed air spraying against the ordinary direction of airflow.



TBCE



TBRE



TCLE

3. Installation

For the installation of air heaters in duct systems, see the special instructions entitled: Installation Instructions for Duct Accessories.

4. Function

Air heater TBCE/TBRE/TCL has a built-in thyristor. This is controlled via a 10 V signal from the air handling unit.

The thyristor variably controls a portion of the output power to some of the heating elements in the air heater. The output power supplied to the other heating elements is controlled in steps by contractors, which together with the thyristor, variably modulate the output between 0 to 100%.

The 0-10 V control signal is obtained from the control unit of the air handling unit, via a pre-wired control cable/quick connector.

The air heater has four series-coupled overheating protection devices. Three of these reset automatically and one must be manually reset. These devices are designed for preventing excess temperature if the airflow becomes too low and for preventing overheating if a malfunction occurs in the ventilation system.

The overheating protection devices are connected to the air handling unit via a control cable/quick connector.

If the overheat protections trip, an alarm is displayed in the hand-held micro terminal of the air handling unit. Check the ventilation system to determine the cause of the malfunction. After you have remedied the fault, reset the overheating protection by pressing the reset button of the air heater and then the reset button on the hand-held micro terminal. A limiting temperature sensor reduces the air heater's maximum output at high temperatures.

Indication

Six green LEDs on the thyristor control circuit card indicate the operating status of thyristor in fixed increments.

LED no.	Indication	Remark
1	Fixed increment 1 active.	If LED no. 5 does not light, despite a 0 - 10 V signal, the limiting temperature sensor is active.
2	Fixed increment 2 active.	
3	Fixed increment 3 active.	
4	Fixed increment 4 active.	
5	Indicate the control signal level: 1 VDC = On 1 sec, Off 9 sec. 2 VDC = On 2 sec, Off 8 sec. 3 VDC = On 3 sec, Off 7 sec. 4 VDC = On 4 sec, Off 6 sec. 5 VDC = On 5 sec, Off 5 sec. 6 VDC = On 6 sec, Off 4 sec. 7 VDC = On 7 sec, Off 3 sec. 8 VDC = On 8 sec, Off 2 sec. 9 VDC = On 9 sec, Off 1 sec. 10 VDC = Constant light.	
6	Flashes once per second when there is a supply voltage. Lights constantly if the limiting temperature sensor is defective.	

5. Electrical connections

Electrical connection shall be performed by an authorised electrician according to applicable regulations.

Control

The air heater is equipped with a control cable, which has a quick connector for connection. The length of the control cable is about 8 metres. An extension cable is available as an accessory.

On air handling unit SILVER C an adapter modular/terminal TBLZ-1-55 is used for further connection to external control. Other accessories are connected to the air handling unit, see the installation or operation and maintenance instructions for the air handling unit.

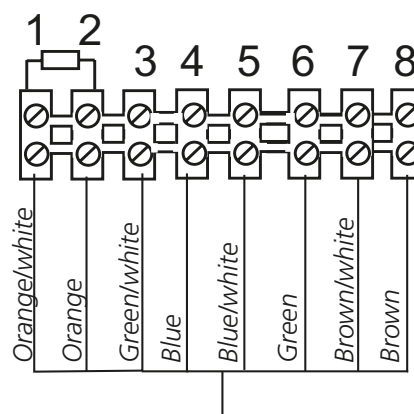
When installing the control cable, the ambient temperature should be 0 – 50 °C. During installation, it is permissible to bend the cable to a minimum radius of curvature of 20 mm. The minimum permissible permanent radius of curvature of the cable is 40 mm.

Power supply

Connect the power supply cable (via a safety isolating switch, is recommended) directly to the air heater according to the tables and illustrations.

The power supply is connected via cable glands fitted in the knock-out holes. Connections for the incoming cable are made in the electrical cabinet behind the inspection cover. See also the tables on the next pages.

NOTE! All connections of internal and external cables with a cross section greater than 2.5 mm² must be retightened!



Control cable (ready wired).

On SILVER C an adapter modular/terminal TBLZ-1-55 is used, see separate instruction.

Cable colour	Function
Orange/white	GND
Orange	Air heater, type (resistance)
Green/white	GND
Blue	Overheating
Blue/white	Not used.
Green	Control signal Y (0 - 10 V)
Brown/white	Not used.
Brown	Not used.

1 X 230V

Article, el. air heater		El. air heater without casing, corresponding AHU	Capacity (kW)	Supply (VAC)	Current (A)	Fuse protection (A)
Without casing	With casing					
TBCE-1-000-025-002-2		COMPACT Unit/Top 02/03	2,5	1x230+N+PE	10,9	1 x 16
TBCE-1-000-031-002-2		GOLD/SILVER C 004/005, conn. standard	2,5	1x230+N+PE	10,9	1 x 16
TBRE-1-060-030-002-2	TCLE-005	GOLD/SILVER C 004/005, conn. full face	2,5	1x230+N+PE	10,9	1 x 16

2 X 400V

Article, el. air heater		El. air heater without casing, corresponding AHU	Capacity (kW)	Supply (VAC)	Current (A)	Fuse protection (A)
Without casing	With casing					
TBCE-1-000-031-004-1		GOLD/SILVER C 004/005, conn. standard	4,5	2x400+N+PE	11,3	2 x 16
TBCE-1-000-040-004-1		GOLD/SILVER C 007/008, conn. standard COMPACT LP 005/008	4,5	2x400+N+PE	11,3	2 x 16
TBRE-1-060-030-004-1	TCLE-005	GOLD/SILVER C 004/005, conn. full face	4,5	2x400+N+PE	11,3	2 x 16
TBRE-1-080-040-004-1	TCLE-008	GOLD/SILVER C 007/008, conn. full face	4,5	2x400+N+PE	11,3	2 x 16

3 X 400V

Article, el. air heater		El. air heater without casing, corresponding AHU	Capac- ity (kW)	Supply (VAC)	Current (A)	Fuse protection (A)
Without casing	With casing					
TBCE-1-000-031-007-1		GOLD/SILVER C 004/005, conn. standard	7,5	3x400+N+PE	10,8	3 x 16
TBCE-1-000-031-010-1			10,2	3x400+N+PE	14,7	3 x 16
TBCE-1-000-040-007-1		GOLD/SILVER C 007/008, conn. standard COMPACT LP 005/008	7,5	3x400+N+PE	10,8	3 x 16
TBCE-1-000-040-012-1			12,0	3x400+N+PE	17,3	3 x 20
TBCE-1-000-040-018-1			18,0	3x400+N+PE	26,0	3 x 32
TBCE-1-000-050-006-1		GOLD/SILVER C 011/012, conn. standard	6,0	3x400+N+PE	8,7	3 x 10
TBCE-1-000-050-012-1			12,0	3x400+N+PE	17,3	3 x 20
TBCE-1-000-050-021-1			21,0	3x400+N+PE	30,3	3 x 32
TBCE-1-000-050-027-1			27,0	3x400+N+PE	39,0	3 x 40
TBRE-1-060-030-007-1	TCLE-005	GOLD/SILVER C 004/005, conn. full face	7,5	3x400+N+PE	10,8	3 x 16
TBRE-1-060-030-010-1	TCLE-005		10,2	3x400+N+PE	14,7	3 x 16
TBRE-1-080-040-007-1	TCLE-008	GOLD/SILVER C 007/008, conn. full face	7,5	3x400+N+PE	10,8	3 x 16
TBRE-1-080-040-012-1	TCLE-008		12,0	3x400+N+PE	17,3	3 x 20
TBRE-1-080-040-018-1	TCLE-008		18,0	3x400+N+PE	26,0	3 x 32
TBRE-1-100-040-006-1	TCLE-012	GOLD/SILVER C 014/020, conn. standard GOLD/SILVER C 011/012, conn. full face	6,0	3x400+N+PE	8,7	3 x 10
TBRE-1-100-040-010-1	TCLE-012		10,2	3x400+N+PE	14,7	3 x 16
TBRE-1-100-040-021-1	TCLE-012		21,0	3x400+N+PE	30,3	3 x 32
TBRE-1-100-040-030-1	TCLE-012		30,0	3x400+N+PE	43,3	3 x 50
TBRE-1-100-040-042-1	TCLE-012		42,0	3x400+N+PE	60,6	3 x 63
TBRE-1-120-050-010-1	TCLE-020	GOLD/SILVER C 025/030, conn. standard GOLD/SILVER C 014/020, conn. full face	10,2	3x400+N+PE	14,7	3 x 16
TBRE-1-120-050-015-1	TCLE-020		15,0	3x400+N+PE	21,7	3 x 25
TBRE-1-120-050-027-1	TCLE-020		27,0	3x400+N+PE	39,0	3 x 40
TBRE-1-120-050-042-1	TCLE-020		42,0	3x400+N+PE	60,6	3 x 63
TBRE-1-120-050-051-1	TCLE-020		51,0	3x400+N+PE	73,6	3 x 80
TBRE-1-140-060-015-1	TCLE-030	GOLD/SILVER C 035/040, conn. standard GOLD/SILVER C 025/030, conn. full face	15,0	3x400+N+PE	21,7	3 x 25
TBRE-1-140-060-021-1	TCLE-030		21,0	3x400+N+PE	30,3	3 x 32
TBRE-1-140-060-033-1	TCLE-030		33,0	3x400+N+PE	47,6	3 x 50
TBRE-1-140-060-045-1	TCLE-030		45,0	3x400+N+PE	65,0	3 x 80
TBRE-1-140-060-066-1	TCLE-030		66,0	3x400+N+PE	95,3	3 x 100
TBRE-1-160-080-021-1	TCLE-040	GOLD/SILVER C 050/060, conn. standard GOLD/SILVER C 035/040, conn. full face	21,0	3x400+N+PE	30,3	3 x 32
TBRE-1-160-080-027-1	TCLE-040		27,0	3x400+N+PE	39,0	3 x 40
TBRE-1-160-080-042-1	TCLE-040		42,0	3x400+N+PE	60,6	3 x 63
TBRE-1-160-080-060-1	TCLE-040		60,0	3x400+N+PE	86,6	3 x 100
TBRE-1-160-080-084-1	TCLE-040		84,0	3x400+N+PE	121,2	3 x 125
TBRE-1-180-100-027-1	TCLE-060/080	GOLD/SILVER C 070/080, conn. standard GOLD/SILVER C 050/060, conn. full face	27,0	3x400+N+PE	39,0	3 x 40
TBRE-1-180-100-042-1	TCLE-060/080		42,0	3x400+N+PE	60,6	3 x 63
TBRE-1-180-100-057-1	TCLE-060/080		57,0	3x400+N+PE	82,3	3 x 100
TBRE-1-180-100-078-1	TCLE-060/080		78,0	3x400+N+PE	112,6	3 x 125
TBRE-1-180-100-099-1	TCLE-060/080		99,0	3x400+N+PE & 3x400+PE	78 & 65	3 x 80 & 3 x 80
TBRE-1-240-120-042-1	TCLE-120	GOLD/SILVER C 100/120, conn. standard GOLD/SILVER C 070/080, conn. full face	42,0	3x400+N+PE	60,6	3 x 63
TBRE-1-240-120-060-1	TCLE-120		60,0	3x400+N+PE	86,6	3 x 100
TBRE-1-240-120-090-1	TCLE-120		90,0	3x400+N+PE	129,9	3 x 160
TBRE-1-240-120-141-1	TCLE-120		141,0	3x400+N+PE & 3x400+PE	116,9 & 86,6	3 x 125 & 3 x 100

3 X 230V

Article, el. air heater		El. air heater without casing, corresponding AHU	Capacity (kW)	Supply (VAC)	Current (A)	Fuse protection (A)
Without casing	With casing					
TBCE-1-000-031-004-2		GOLD/SILVER C 004/005, conn. standard	4,5	3x230+PE	11,3	3 x 16
TBCE-1-000-031-007-2			7,5	3x230+PE	18,8	3 x 20
TBCE-1-000-031-010-2			10,2	3x230+PE	25,6	3 x 32
TBCE-1-000-040-004-2		GOLD/SILVER C 007/008, conn. standard COMPACT LP 005/008	4,5	3x230+PE	11,3	3 x 16
TBCE-1-000-040-007-2			7,5	3x230+PE	18,8	3 x 20
TBCE-1-000-040-012-2			12,0	3x230+PE	30,1	3 x 32
TBCE-1-000-040-018-2			18,0	3x230+PE	45,2	3 x 50
TBCE-1-000-050-006-2		GOLD/SILVER C 011/012, conn. standard	6,0	3x230+PE	15,1	3 x 16
TBCE-1-000-050-012-2			12,0	3x230+PE	30,1	3 x 32
TBCE-1-000-050-021-2			21,0	3x230+PE	52,7	3 x 63
TBCE-1-000-050-027-2			27,0	3x230+PE	67,8	3 x 80
TBRE-1-060-030-004-2	TCLE-005	GOLD/SILVER C 004/005, conn. full face	4,5	3x230+PE	11,3	3 x 16
TBRE-1-060-030-007-2	TCLE-005		7,5	3x230+PE	18,8	3 x 20
TBRE-1-060-030-010-2	TCLE-005		10,2	3x230+PE	25,6	3 x 32
TBRE-1-080-040-004-2	TCLE-008	GOLD/SILVER C 007/008, conn. full face	4,5	3x230+PE	11,3	3 x 16
TBRE-1-080-040-007-2	TCLE-008		7,5	3x230+PE	18,8	3 x 20
TBRE-1-080-040-012-2	TCLE-008		12,0	3x230+PE	30,1	3 x 32
TBRE-1-080-040-018-2	TCLE-008		18,0	3x230+PE	45,2	3 x 50
TBRE-1-100-040-006-2	TCLE-012	GOLD/SILVER C 014/020, conn. standard GOLD/SILVER C 011/012, conn. full face	6,0	3x230+PE	15,1	3 x 16
TBRE-1-100-040-010-2	TCLE-012		10,2	3x230+PE	25,6	3 x 32
TBRE-1-100-040-021-2	TCLE-012		21,0	3x230+PE	52,7	3 x 63
TBRE-1-100-040-030-2	TCLE-012		30,0	3x230+PE	75,3	3 x 80
TBRE-1-100-040-042-2	TCLE-012		42,0	3x230+PE	105,4	3 x 125
TBRE-1-120-050-010-2	TCLE-020	GOLD/SILVER C 025/030, conn. standard GOLD/SILVER C 014/020, conn. full face	10,2	3x230+PE	25,6	3 x 32
TBRE-1-120-050-015-2	TCLE-020		15,0	3x230+PE	37,7	3 x 40
TBRE-1-120-050-027-2	TCLE-020		27,0	3x230+PE	67,8	3 x 80
TBRE-1-120-050-042-2	TCLE-020		42,0	3x230+PE	105,4	3 x 125
TBRE-1-120-050-051-2	TCLE-020		51,0	3x230+PE	128,0	3 x 160
TBRE-1-140-060-015-2	TCLE-030	GOLD/SILVER C 035/040, conn. standard GOLD/SILVER C 025/030, conn. full face	15,0	3x230+PE	37,7	3 x 40
TBRE-1-140-060-021-2	TCLE-030		21,0	3x230+PE	52,7	3 x 63
TBRE-1-140-060-033-2	TCLE-030		33,0	3x230+PE	82,8	3 x 100
TBRE-1-140-060-045-2	TCLE-030		45,0	3x230+PE	113,0	3 x 125
TBRE-1-140-060-066-2	TCLE-030		66,0	3x230+PE & 3x230+PE	90,4 & 75,3	3 x 100 & 3 x 80
TBRE-1-160-080-021-2	TCLE-040	GOLD/SILVER C 050/060, conn. standard GOLD/SILVER C 035/040, conn. full face	21,0	3x230+PE	52,7	3 x 63
TBRE-1-160-080-027-2	TCLE-040		27,0	3x230+PE	67,8	3 x 80
TBRE-1-160-080-042-2	TCLE-040		42,0	3x230+PE	105,4	3 x 125
TBRE-1-160-080-060-2	TCLE-040		60,0	3x230+PE & 3x230+PE	90,3 & 60,2	3 x 100 & 3 x 80
TBRE-1-160-080-084-2	TCLE-040		84,0	3x230+PE & 3x230+PE	90,3 & 120,5	3 x 100 & 3 x 125
TBRE-1-180-100-027-2	TCLE-060/080	GOLD/SILVER C 070/080, conn. standard GOLD/SILVER C 050/060, conn. full face	27,0	3x230+PE	67,8	3 x 80
TBRE-1-180-100-042-2	TCLE-060/080		42,0	3x230+PE	105,4	3 x 125
TBRE-1-180-100-057-2	TCLE-060/080		57,0	3x230+PE & 3x230+PE	90,4 & 52,7	3 x 100 & 3 x 63
TBRE-1-180-100-078-2	TCLE-060/080		78,0	3x230+PE & 3x230+PE	90,4 & 105,4	3 x 100 & 3 x 125
TBRE-1-180-100-099-2	TCLE-060/080		99,0	3x230+PE & 3x230+PE	135,5 & 113	3 x 160 & 3 x 125
TBRE-1-240-120-042-2	TCLE-120	GOLD/SILVER C 100/120, conn. standard GOLD/SILVER C 070/080, conn. full face	42,0	3x230+PE	105,4	3 x 125
TBRE-1-240-120-060-2	TCLE-120		60,0	3x230+PE & 3x230+PE	90,4 & 60,2	3 x 100 & 3 x 80
TBRE-1-240-120-090-2	TCLE-120		90,0	3x230+PE & 3x230+PE	90,4 & 135,5	3 x 100 & 3 x 160
TBRE-1-240-120-141-2	TCLE-120		141,0	3x230+PE & 3x230+PE	180,7 & 173,2	3 x 200 & 3 x 200