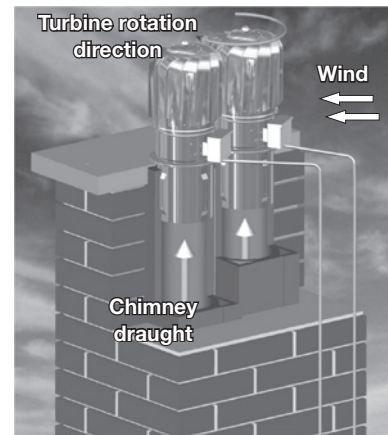


## PICTURE



## FUNCTION PRINCIPLE



## DESCRIPTION

Rotary chimney cowl Hybrid Turbowent Tulipan is a device, which, in a dynamic way, uses force of the wind to increase chimney draught, it is also equipped with a low power, brushless electric motor used to stabilize it. The turbine always rotates in the same direction no matter of the wind strength or its direction. It is to be mounted on gravitation based ventilation duct endings.

When the wind speed is too small to achieve the desired efficiency, electric motor speeds the turbine up, when it is too strong it slows the turbine down. When the wind speed is strong enough to achieve the rotation speed set on the steering device, motor does not work, and cowl works just like the ordinary Turbowent Tulipan.

**Network version - NET** is equipped with a logic module placed in the control box of the base. This module allows to integrate cowls into a network and control them by using special Darco PC computer programme.

Network version is compatible with intelligent building systems based on the protocole of data transmission Verso-Bus type.

Speed controller voltage	24VDC
Rotating unit	ball bearing system
Maximal power consumption	0,3A
Average power consumption	~0,13A
Average input power	3,1 W
Adjusting range	90-500 rev/min
Recommended power supply	24VDC, 1A
Ambient temperature	from -30 °C to +70°C

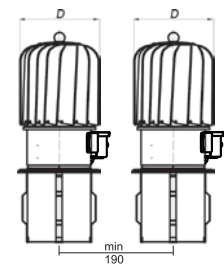
Sound pressure level A at a distance of 4 m from cowl (for rotational speed n)			Sound pressure level LWA (for min. rotation speed) according to PN-EN ISO 3741:2003	
Diameter	L <sub>pAmin</sub> for n=90	L <sub>pAmax</sub> for n=270	Diameter	L <sub>WA</sub>
Ø150	8 dB	15 dB	Ø150	26 dB

## DESTINATION

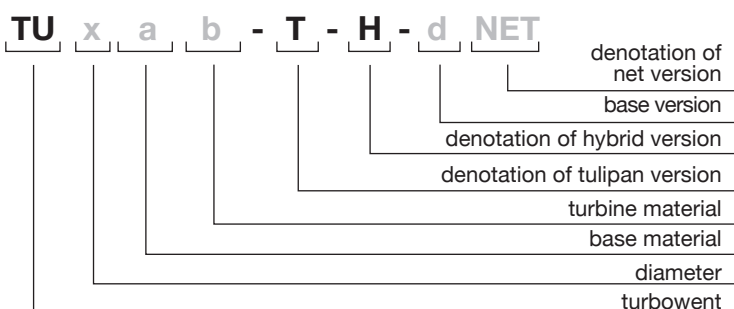
- when there are wind fluctuations on the chimney duct ending, caused by its bad location
- when there is an unfavorable terrain configuration, with strong and frequent winds
- when there is a lack of chimney draught or it is too weak
- in order to improve the natural (gravitation) ventilation
- to build hybrid ventilation systems

## MEASUREMENTS

Diameter	Turbine diameter D [mm]
Ø150	~ 188



## DENOTATIONS / PRODUCT CODES



## MATERIALS

Destination	W	W	W	W - ventilation ducts
	-	-	-	S - gas and oil exhaust ducts
	-	-	-	D - smoke ducts
Base material	CH	CH	-	CH - chrome-nickel sheet 1.4301
	-	-	-	OC - galvanised steel sheet
	-	-	ML	ML - chrome-nickel powder coated
Turbine material	-	CH	-	CH - chrome-nickel sheet 1.4301
	-	-	ML	ML - powder coated
	AL	-	-	AL - aluminum

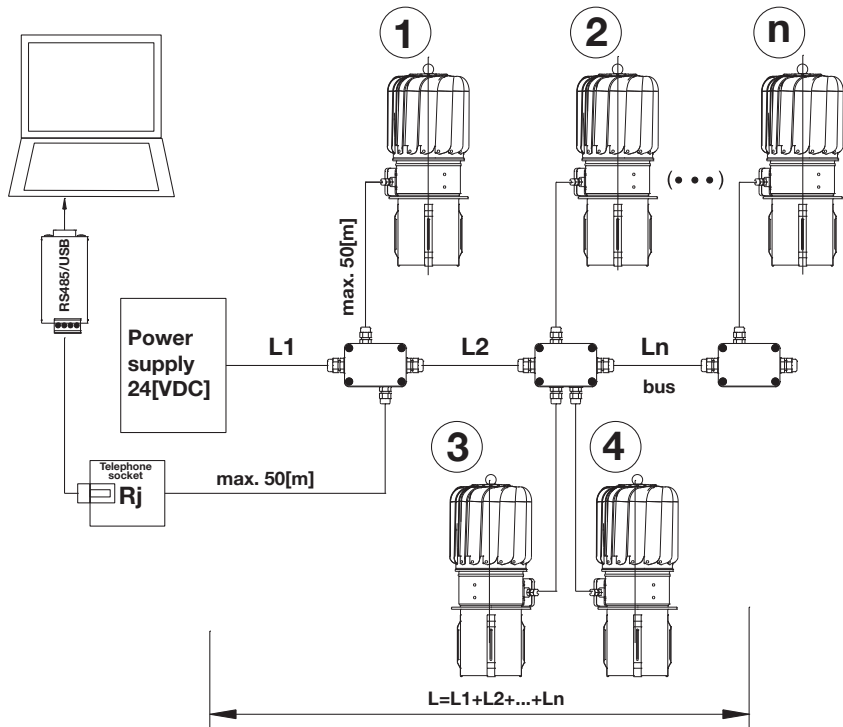
## CONNECTION DIAGRAMS

Kabel	Cross-sectional area [mm <sup>2</sup> ]	Resistance 1[m] of cable R <sub>jk</sub> [ohm/m]
single UTP	0,18	0,196667
double UTP	0,36	0,098333
triple UTP	0,45	0,078667
4x0,5	0,50	0,070800
4x0,75	0,75	0,047200
4x1	1,00	0,035400
4x1,5	1,50	0,023600
4x2,0	2,00	0,017700
4x2,5	2,50	0,014160

\* Set does not include cables

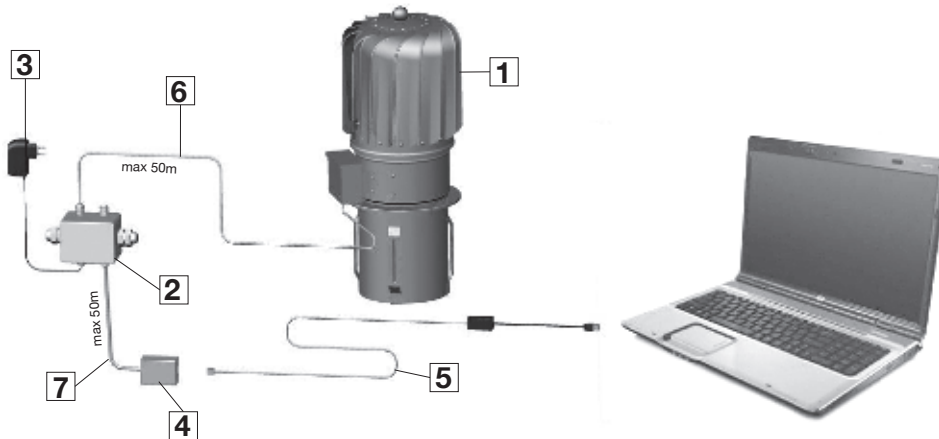
### For main line (bus):

Allowed line resistance  $R_{dop}=19,5/n$  [ohm]  
 Wire resistance 1[mb]  $R_j=R_{dop}/L$  [ohm/m]  
 Condition for correct operation  $R_j < R_{jk}$   
 Power supply  $P=5 \cdot n$  [W]  
 Copper cable

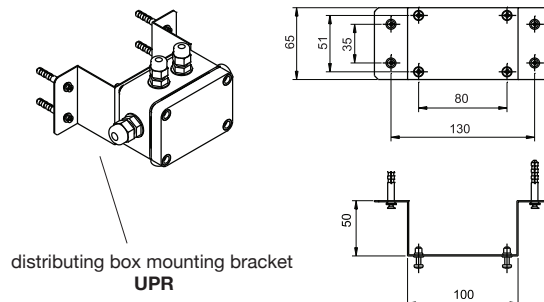


## CONNECTING DIAGRAM

### 1. HYBRID TYRBOWENT TULIPAN - NET (1 SZT.)



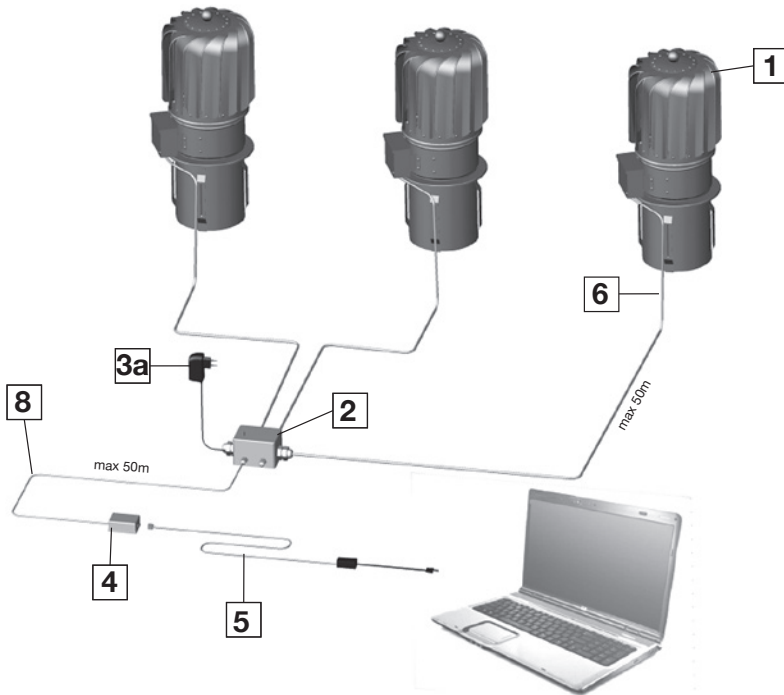
Lp	Symbol	Name
1	TU...CHAL-T-H...-NET	Hybrid Turbowent Tulipan NET
2	TU-HYB-PUSZKA	Distributing box
3	TU-Z-24V/1A	Power supply [VDC]
4	TU-RJ116P4C	Telephone socket
5	TU-HYB-KONW-USB	Converter RS485/USB
6	LGY4x0,5	Cable LGY 4x0,5
7	LGY2x0,75	Cable LGY 2x0,75



\* Set does not include cables

# HYBRID TURBOWENT TULIPAN - rotary chimney cowl Ø150 - NET version

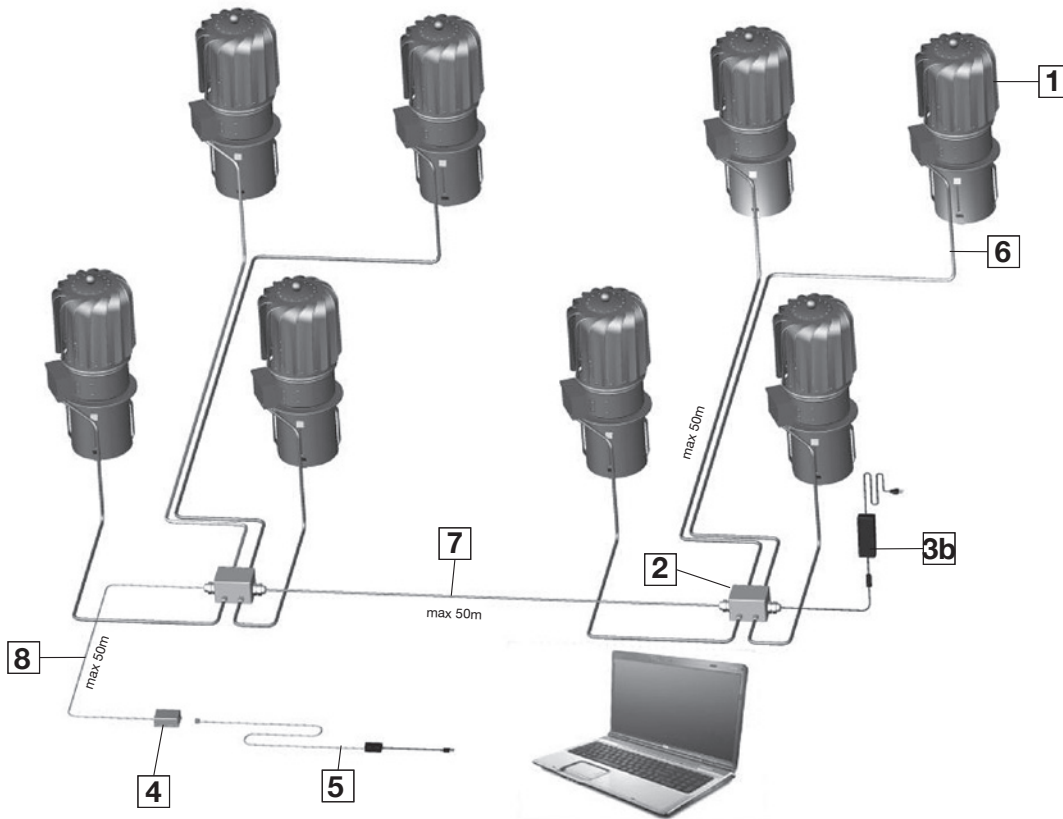
## 2. HYBRID TYRBOWENTS TULIPAN - NET - (FROM 1 TO MAX. 4 PIECES)



Lp	Symbol	Name
1	TU...CHAL-T-H-...-NET	Hybrid Turbowent Tulipan NET
2	TU-HYB-PUSZKA	Distributing box
3a	TU-Z-24V/1A	Power supply [VDC] (rys.2)
3b	TU-Z-24V/2,7A	Power supply [VDC] (rys.3)
4	TU-RJ116P4C	Telephone socket
5	TU-HYB-KONW-USB	Converter RS485/USB
6	LGY4x0,5	Cable LGY 4x0,75
7	LGY4x0,75	Cable LGY 4x0,75
8	LGY2x0,75	Cable LGY 2x0,75

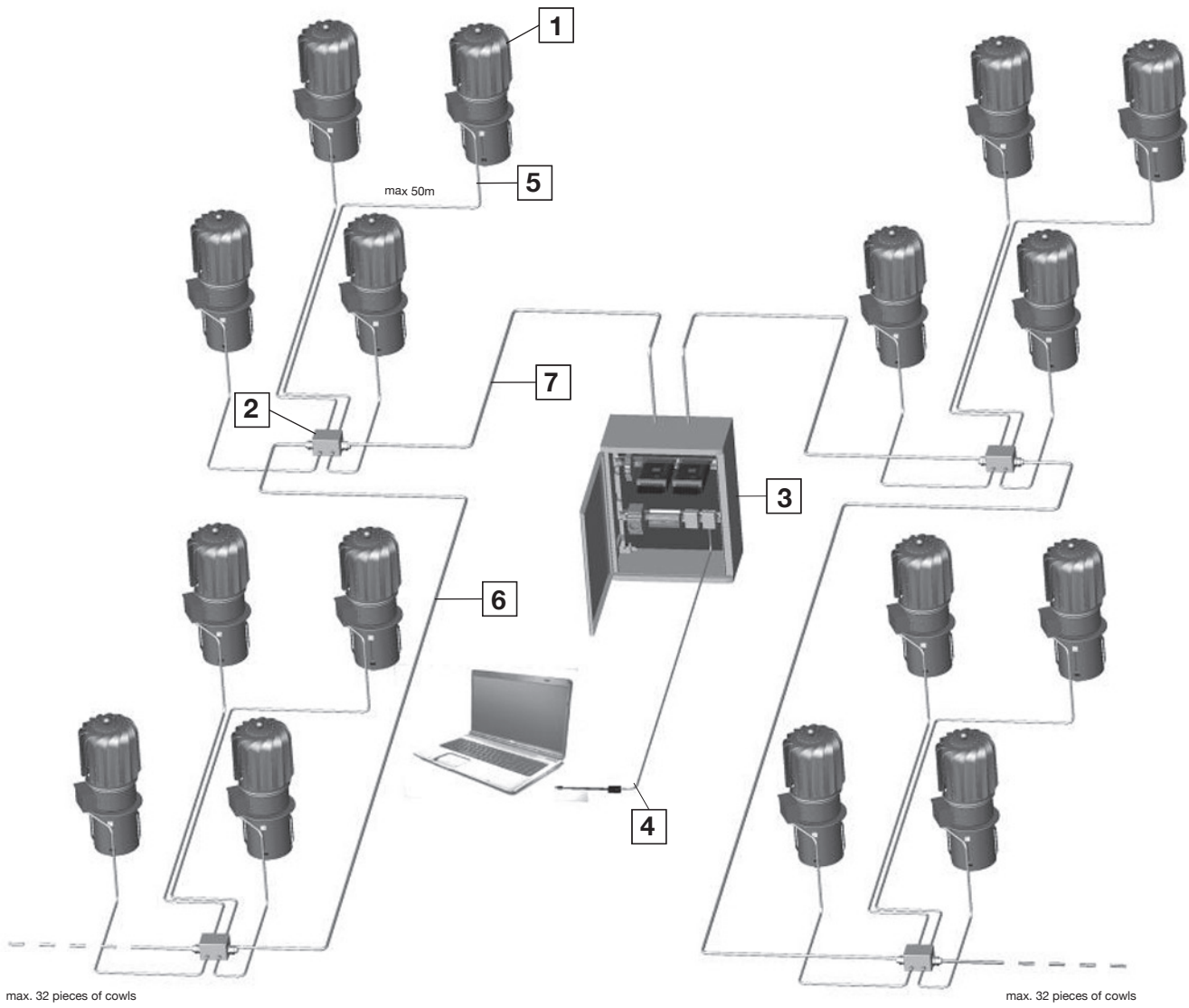
\* Set does not include cables

## 3. HYBRID TYRBOWENTS TULIPAN - NET (FROM 1 TO MAX. 8 PIECES)



# HYBRID TURBOWENT TULIPAN - rotary chimney cowl Ø150 - NET version

## 4. HYBRID TYRBOWENTS TULIPAN - NET (FROM 8 TO MAX. 64 PIECES)

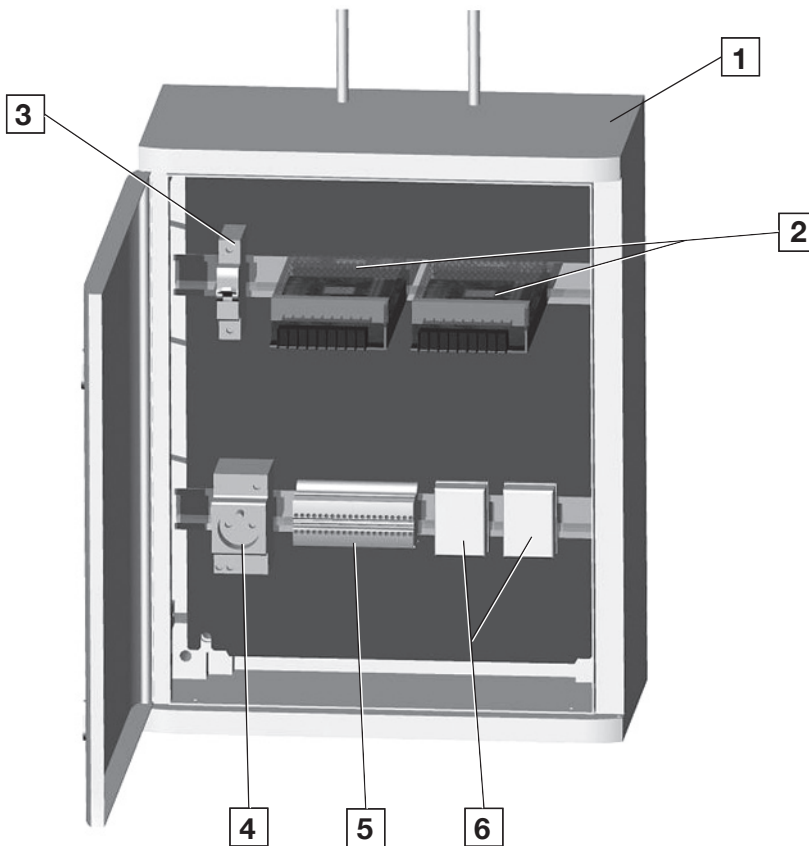


Lp	Symbol	Name
1	TU...CHAL-T-H- NET	Hybrid Turbowent Tulipan NET
2	TU-HYB-PUSZKA	Distributing box
3	TU-SZROZ-II	Distributing box
4	TU-HYB-KONW-USB	Converter RS485/USB
5	LGY4x0,5	Cable LGY 4x0,5
6	LGY4x0,75	Cable LGY 4x0,75
7	LGY4x1,5	Cable LGY 4x1,5

\* Set does not include cables

The above diagram shows a possibility of connecting up to 64 hybrid cowls in NET versions. System is divided into 2 sections of 32 pieces each.

### ELECTRIC CABINET



#### TU-SZROZ-I-NET\*

Lp	Symbol	Pcs
1	Electric cabinet /400x300x200/	1
2	Power supply SDR-240-24	1
3	Safety fuse 4A "C"	1
4	Supply socket 230V AC	1
5	Terminal block	1
6	Sockets	2

\* Electric cabinet is designed to connect one net of hybrid turbowents (up to 32 cowls). Terminal block allows to connect two cowl sections - 16 cowls in each section.

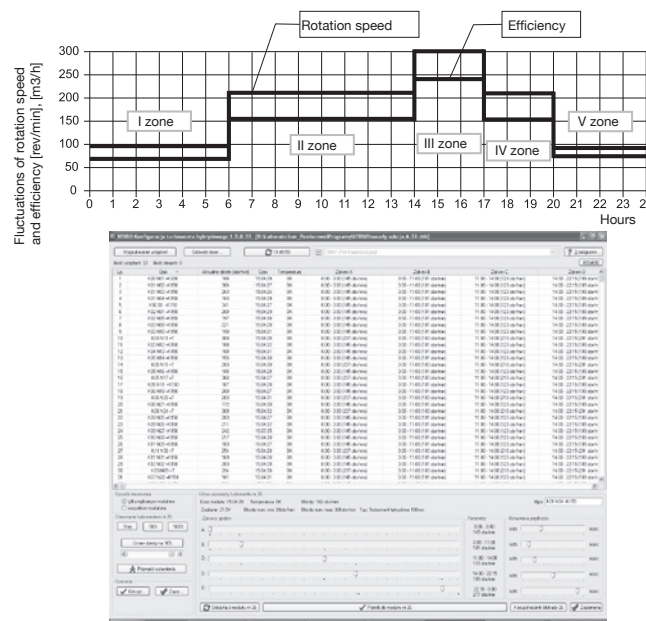
#### TU-SZROZ-II-NET\*

Lp	Symbol	Pcs
1	Electric cabinet /500x400x200/	1
2	Power supply SDR-240-24	1
3	Safety fuse 4A "C"	1
4	Supply socket 230V AC	1
5	Terminal block	1
6	Sockets	2

\* Electric cabinet is designed to connect two nets of hybrid turbowents (up to 32 cowls in each net). Terminal block allows to connect two cowl sections divided on two sections- 16 cowls in each section. Electric cabinet can be mounted inside and outside buildings, as it has the protection level IP = 66.

## 6. PROGRAMME STH-ADMIN

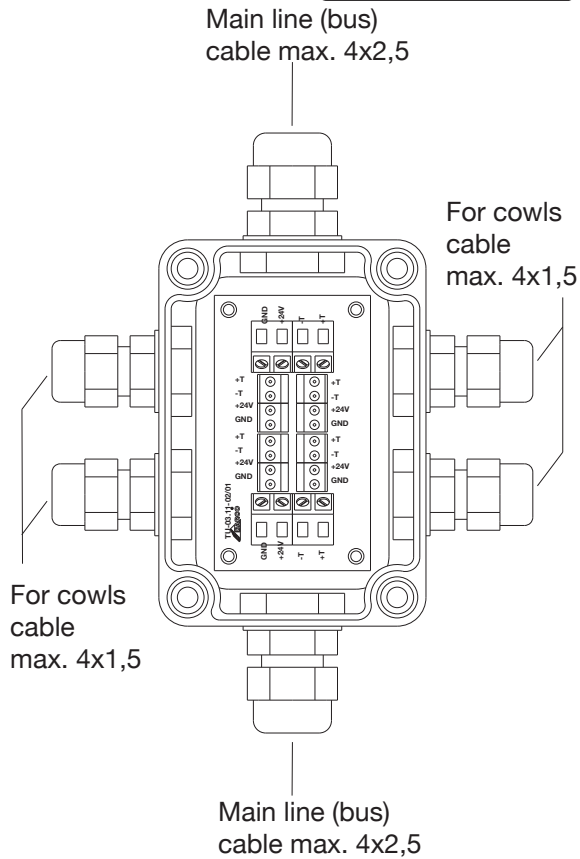
Freeware software to control the working of hybrid cowls. It allows to set different cowls rotating speed and therefore ventilation efficiency in different time zones. Programme can be downloaded from producer's website: [www.darco.com.pl](http://www.darco.com.pl)



### WIRING DIAGRAMS

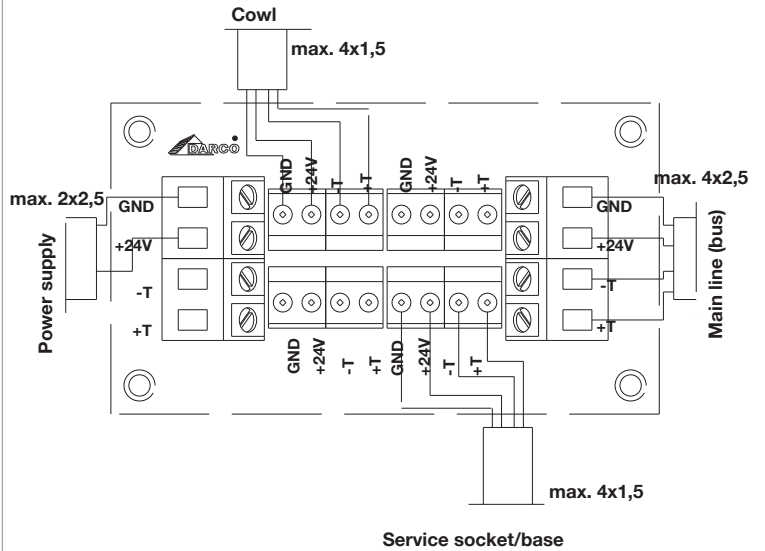
#### JUNCTION BOX

**TU-HYBR-PUSZKA**

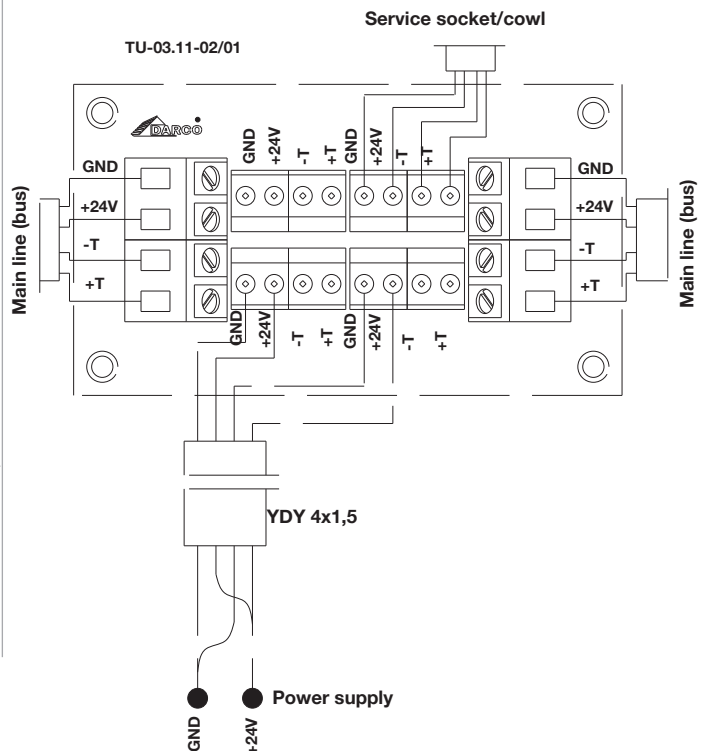


Protection level IP = 65

#### Frontal power connection (connection inside the junction box)

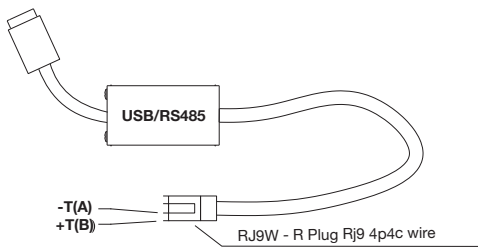


#### Side power connection with main line (bus) cable size higher than 4x1,5 (connection inside the junction box)



#### CONVERTER RS485/USB

**TU-HYB-KONW-USB**



#### RJ11GN TELEPHONE SOCKET ON SURFACE MOUNTED RJ11 6P4C

