

Ultrasonic Wind Sensor



Data provided by the ultrasonic wind sensor:

Wind speed measurement from 0,12 to 40 m/s
Measurement of relative wind direction from 0 to 359°
Temperature measurement from -15°C (excluding frost) to +55°C

Sensor specifications:

Sensitivity of wind speed measurement: 0,12 m/s
Resolution of wind speed measurement: 0,1 m/s
Sensitivity of wind direction measurement: $\pm 1^\circ$
Resolution of wind direction measurement: 1°
Accuracy of wind speed and direction measurement, (typical values).
Speed : $\pm 5\%$ of the true value $\pm 0,5$ m/s up to 25 m/s
Angle : ± 3 degrees for a speed higher than 7 m/s.
Temperature measurement resolution: 1°C
Start-up time: 4 s
Digital output : RS422 / RS232
Sentences NMEA0183 used :
 Wind data – MWV- twice per second
 Temperature data – XDR - twice per second
Transmission speed : 4800 bauds
Supply voltage: de 8 à 30 Volts DC
Power consumption: 9 mA
CE standard : EN 55022 EN 55024
Operating temperature range: -15°C (without icing) to +55°C
Sensor dimensions : Cylindrical Ø 64 mm Height 61 mm
Dimensions of support mast: Anodised aluminium tube length 330 mm, Ø 16mm

420-AC interface

Power supply 24 V DC (35 mA*) or AC (31 mA*)
1 port for ultrasonic wind sensor (12V and data RS422) isolated from power supply
1 isolated output 4-20mA for anemometer, range 0-60 m/s
1 isolated output 4-20mA for wind vane, range 0° - 359°
1 dry contact Alarm 1 open at rest, breaking capacity 1A / 220V AC
1 dry contact Alarm 2 open at rest, breaking capacity 1A / 220V AC
1 wind sensor activity light, Data received.
1 420-AC interface activity light, Data read.
Under the protective cover:
1 normal mode / configuration selection switch
1 test push-button Alarm 1
1 test push-button Alarm 2
Weight : 135 gr

Interface features :

Threshold setting Alarm 1
Threshold setting Alarm 2
Hysteresis setting of the 2 alarms in %
Relay test Alarm 1
Relay test Alarm 2
Anemometer output resolution 0.1 m/s
Wind vane output resolution 1°

* Without current loop load, with sensor connected

Equipment supply :

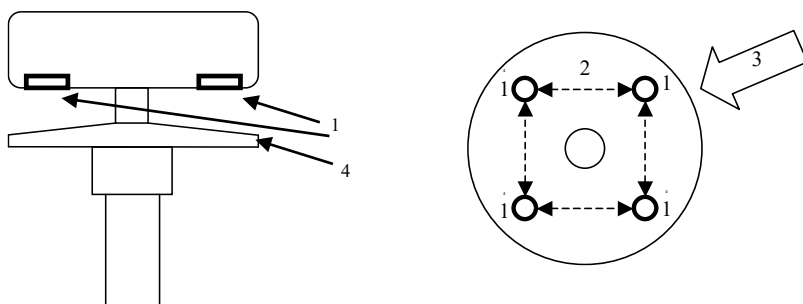
- Sensor head CV7-V and vertical support tube 310 mm, Ø 16mm.
- 25m cable length +/- 10%.
- 420-AC interface and user manual.

1. Operation principle

The sound, ultrasound, is transported by the movement of the fluid through which it passes. Electroacoustic transducers (1) communicate two by two by means of ultrasonic signals (2) in order to determine, along orthogonal axes, the differences in wave transit times induced by the air flow (3). The measurements are composed in an integrated calculator which establishes the wind module and its direction in relation to a reference axis. The temperature measurement is used to perfect the calibration. In the CV7, the transducers communicate laterally which provides four independent measurements. This reinforces validity checks and the vectors measured at the headwind are preferred to establish speed and direction.

The method provides a sensitivity of 0.12 m/s, a dynamic range of 40 m/s and excellent linearity.

The effect of the inclination of the sensor (4) on the measured wind module is partially corrected due to the space profile.



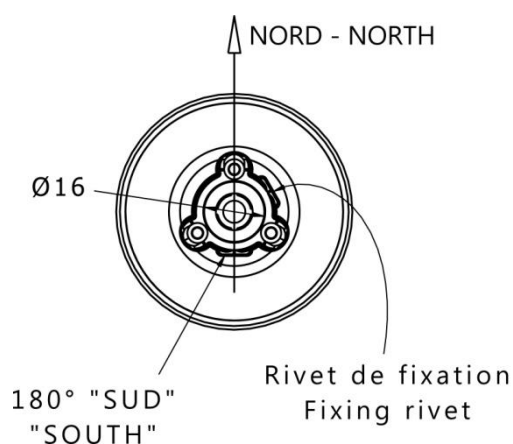
EN 55022 EN 55024

2. Installation of ultrasonic wind sensor

Find a location free of wind obstructions, usually at the top of the mast.

Orient the ultrasonic wind sensor in such a way that it faces North (North marker under the sensor).

Tighten the grub screws.



A better accuracy of the axis can be achieved by using the angle correction program. Route the cable to the space reserved for the display.

Avoid, as far as possible, the proximity of cables likely to induce high levels of radio interference.

3. Installation of Interface 420-AC

DIN box, 71 X 90 X 58 mm



Dry contact
Alarm 1

Dry contact
Alarm 2

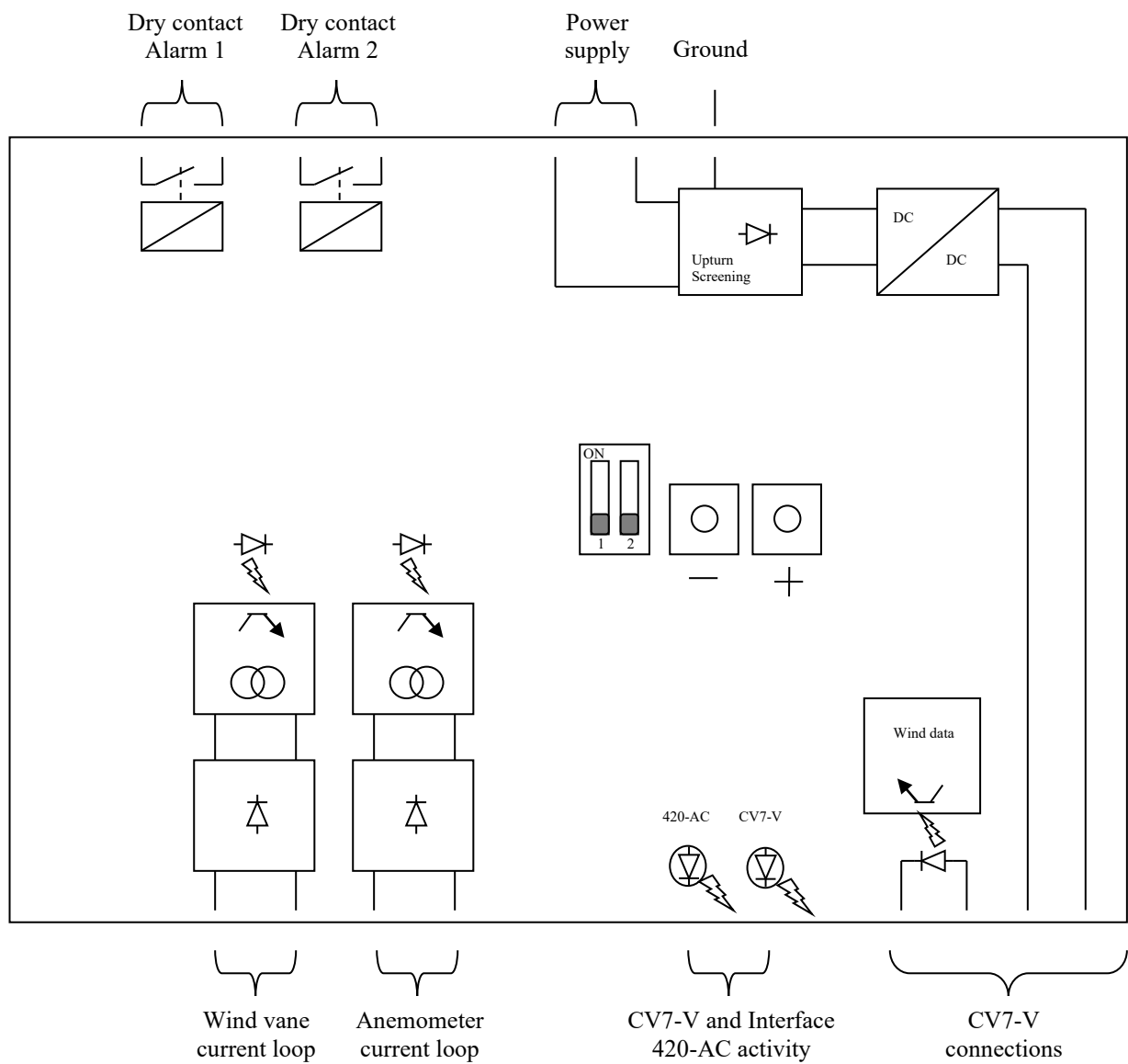
Power
supply

Relais 1a	Relais 1b	Relais 2a	Relais 2b	24V DC/AC	0V	Terre				
 www.lcjcapteurs.com Tel: 02 40 05 08 55				Convertisseur Type: CV7-420-AC Girouette-anémomètre sonore N° Série: 051521677-6001 Alimentation: 24V DC-AC +/-20% Made in France						
Gir. a	Gir. b	Anémo a	Anémo b	Data Out	Data In	Vert	Jaune	Bleu	Rouge	
Wind vane current loop		Anemometer current loop		CV7-V and Interface 420-AC activity		CV7-V connections				

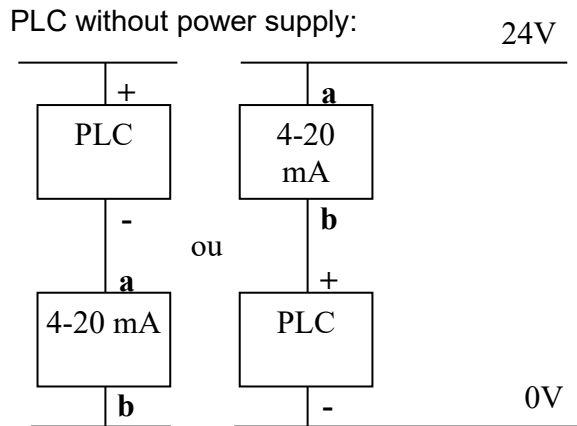
1H	2H	3H	4H	N.C.	6H	7H	8H	N.C.	N.C.	N.C.	N.C.
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Relais 1a	Relais 1b	Relais 2a	Relais 2b	24V DC/AC	0V	Terre					
 www.lcjcapteurs.com Tel: 02 40 05 08 55				Convertisseur Type: CV7-420-AC Girouette-anémomètre sonique N° Série: 051521677-6001 Alimentation: 24V DC-AC +/-20% Made in France							
Gir. a	Gir. b	Anémo a	Anémo b		Data Out	Data In	Vert	Jaune	Bleu	Rouge	

N.C.	2B	3B	4B	5B	N.C.	N.C.	N.C.	9B	10B	11B	12B
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4. Wiring of current loops



5. Wiring of the ultrasonic wind sensor

- Blue wire to "Blue" marker
- Yellow wire to "Yellow" marker
- Green wire to "Green" marker
- Red wire at the "Red" marker

6. Alarm configuration

To access the setting, remove the cover by unclipping it.

>> During configuration, the "anemo" current loop transmits the value currently being set.

>> In normal operation, switch 1 and 2 are Off.

Configuration of Alarm 1 :

- Refer to the "Alarm Setting" table to determine the desired current.
- Set switch 1 to On, switch 2 remains Off
- Press the - and + buttons to obtain the desired current

Configuration of Alarm 2 :

- Refer to the "Alarm Setting" table to determine the desired current.
- Set switch 1 to On, switch 2 remains Off
- Press the - and + buttons to obtain the desired current

Hysteresis configuration :

- Refer to the "Hysteresis Setting" table to determine the desired current.
- Set switch 1 to On, switch 2 remains Off
- Press the - and + buttons to obtain the desired current

Storage of values :

Set switch 1 to Off, switch 2 to Off

>> In normal operating mode, switches 1 and 2 are Off

- Pressing the push button - triggers the Alarm 1 relay
- Pressing the + button triggers the Alarm 2 relay

7. Alarm setting table

Alarm setting

Hysteresis setting

Réglage ALARME \ Réglage hystérésis							
m/s	Intensité (mA)	nœud	Intensité (mA)	k/h	Intensité (mA)	Hystérésis	Intensité (mA)
0	4	0	4	0	4	0	4
1	4,4	2	4,4	4	4,4	2,5	4,4
2	4,8	4	4,8	8	4,9	5	4,8
3	5,2	6	5,2	12	5,3	7,5	5,2
4	5,6	8	5,6	16	5,8	10	5,6
5	6	10	6	20	6,2	12,5	6
6	6,4	12	6,5	24	6,7	15	6,4
7	6,8	14	6,9	28	7,1	17,5	6,8
8	7,2	16	7,3	32	7,6	20	7,2
9	7,6	18	7,7	36	8	22,5	7,6
10	8	20	8,1	40	8,4	25	8
11	8,4	22	8,5	44	8,9	27,5	8,4
12	8,7	24	8,9	48	9,3	30	8,7
13	9,2	26	9,4	52	9,8	32,5	9,2
14	9,5	28	9,8	56	10,2	35	9,5
15	10	30	10,2	60	10,7	37,5	10
16	10,3	32	10,6	64	11,1	40	10,3
17	10,7	34	11	68	11,6	42,5	10,7
18	11,1	36	11,4	72	12	45	11,1
19	10,5	38	11,8	76	12,4	47,5	10,5
20	11,9	40	12,2	80	12,9	50	11,9
21	12,3	42	12,6	84	13,3	52,5	12,3
22	12,7	44	13	88	13,8	55	12,7
23	13,1	46	13,5	92	14,2	57,5	13,1
24	13,5	48	13,9	96	14,7	60	13,5
25	13,9	50	14,3	100	15,1	62,5	13,9
26	14,3	52	14,7	104	15,6	65	14,3
27	14,7	54	15,1	108	16	67,5	14,7
28	15,1	56	15,5	112	16,4	70	15,1
29	15,5	58	15,9	116	16,9	72,5	15,5
30	15,9	60	16,4	120	17,3	75	15,9
31	16,3	62	16,8	124	17,8	77,5	16,3
32	16,7	64	17,2	128	18,2	80	16,7
33	17,1	66	17,6	132	18,7	82,5	17,1
34	17,6	68	18	136	19,1	85	17,6
35	18	70	18,4	140	19,6	87,5	18
36	18,4	72	18,8	144	20	90	18,4
37	18,8	74	19,2			92,5	18,8
38	19,2	76	19,6			95	19,2
39	19,6	78	20			97,5	19,6
40	20					100	20

Fonction de transfert :	X = valeur en :	Résultat en :
$(X/2,5)+4$	m/s	mA
$(X/3,6/2,5)+4$	k/h	mA
$(X/1,9438/2,5)+4$	nœud	mA
$(X/6,25)+4$	%	mA

Fonction de transfert :	X = valeur en :	Résultat en :
$(X-4)*2,5$	mA	m/s
$(X-4)*2,5*3,6$	mA	k/h
$(X-4)*2,5*1,9438$	mA	nœud
$(X-4)*6,25$	mA	%

Transfer function

Value

Result

8. NMEA0183 standard

Output on a 4 mA current loop.

Baud rate 4800, data bit 8, parity none, stop bit 1

Constant flow 0.5 seconds

Variable length fields, delimiter « , ».

Start of sentence : \$

End of sentence : CR,LF

Examples :

\$IIMWV,226.0,R,000.0,N,A*0B

\$WIXDR,C,036.5,C,,*52

\$PLCJ,67FF,6EFF,28,,5050,5050

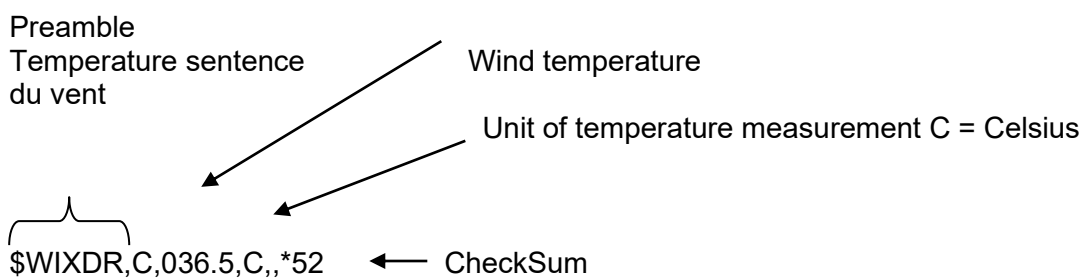
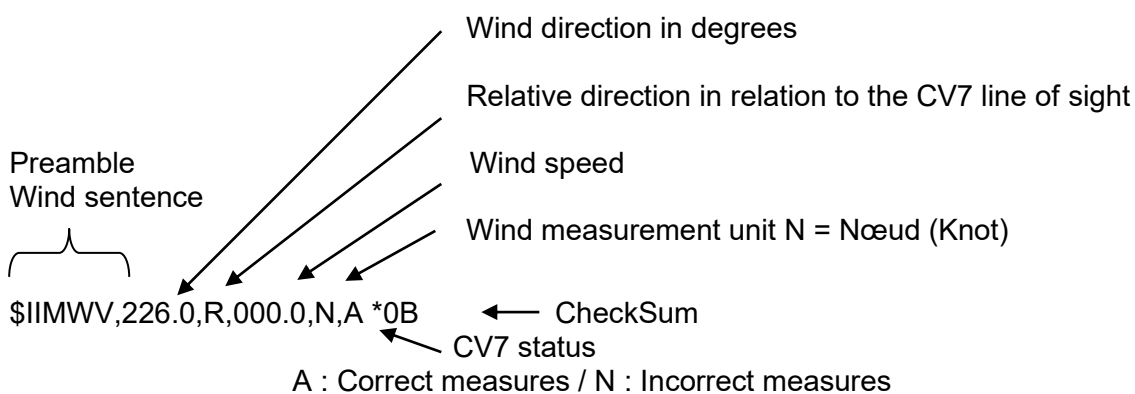
\$PLCJEA870,6D98,C500,0056,AC,

\$IIMWV,226.0,R,000.0,N,A*0B

\$WIXDR,C,036.5,C,,*52

\$PLCJ,67FF,6EFF,28,,5050,5050

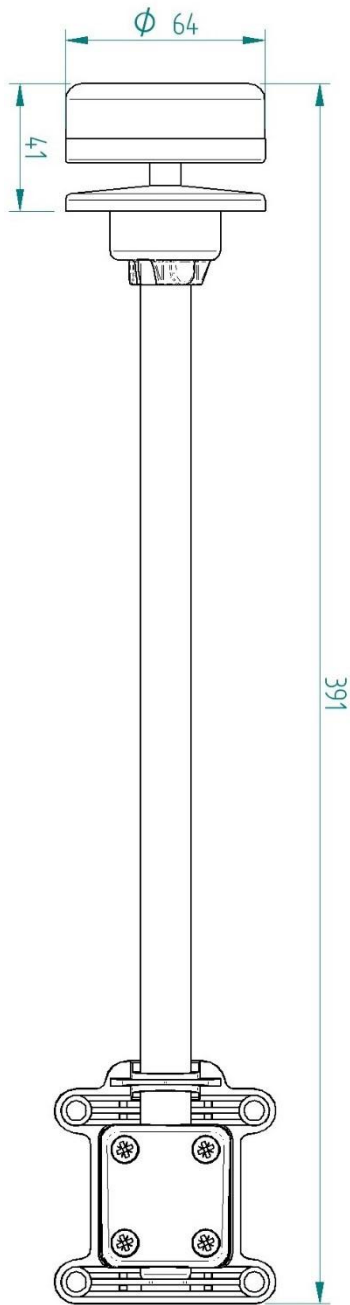
\$PLCJEA870,6D98,C500,0056,AC,



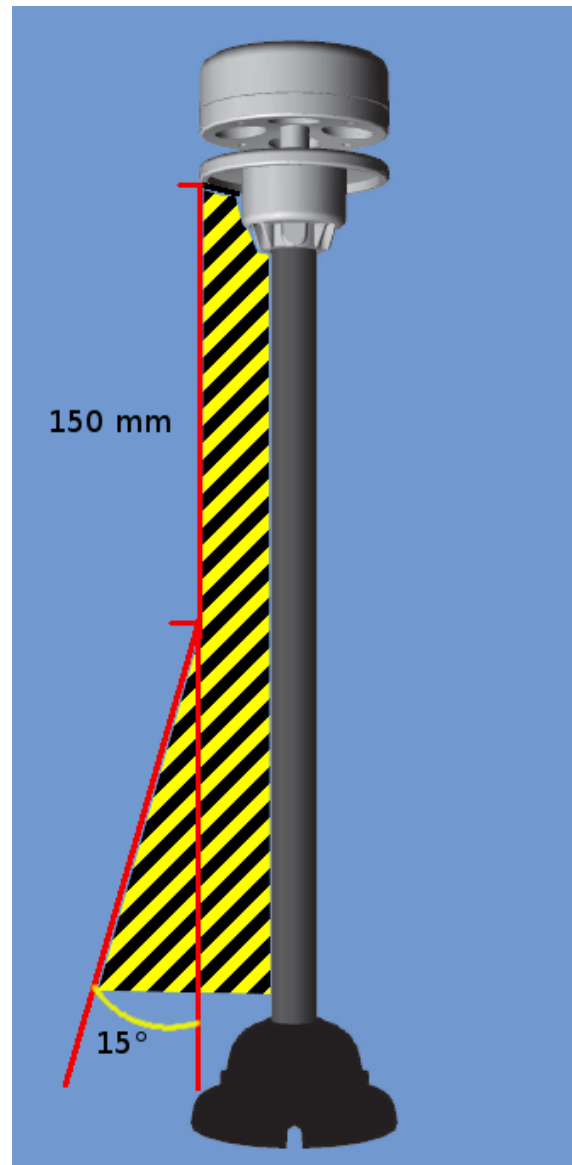
`$PLCJ,AAAA,BBBB,CC,,,DDDD,EEEE`
`$PLCJEFFFF,GGGG,HHHH,IIII,JJ`

} Sentences for LCJ Capteurs technical service use

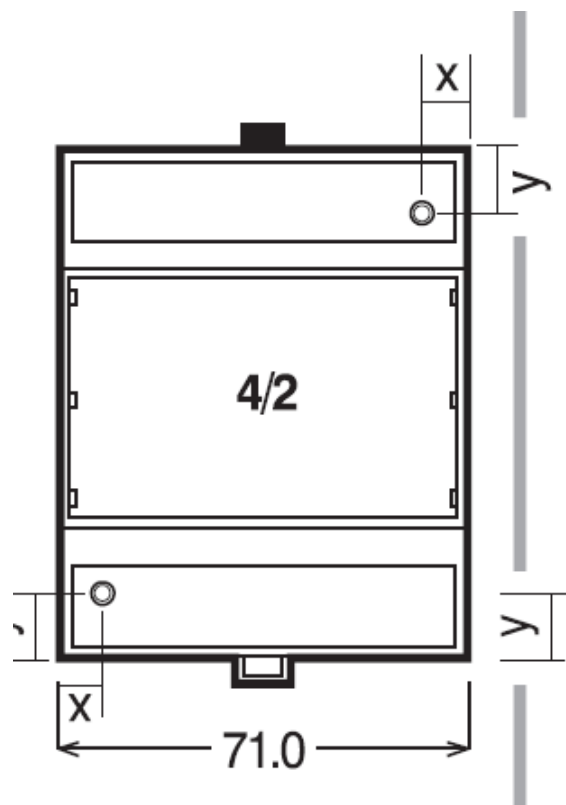
9. CV7-V dimensions



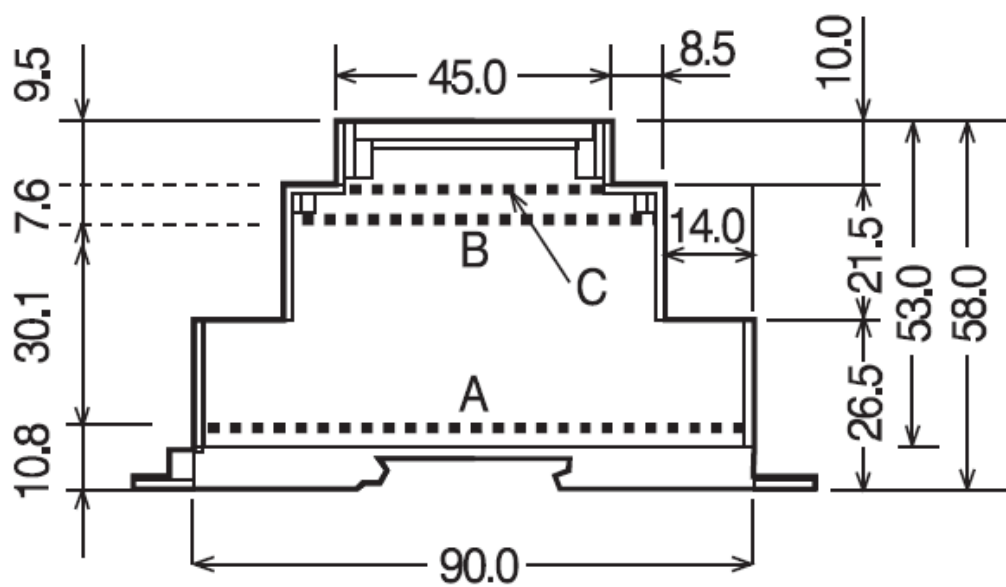
Shaded area:
keep clear of any obstacles



10. DIN Box dimensions (mm)



Box size	X	Y
4	8.8	18.3



11. Warranty

Your SONIC-ANEMO-420-AC sensor is warranted against defects in materials and workmanship for a period of 2 years from the date of purchase.

LCJ Capteurs will repair or replace the defective product free of charge, excluding the shipping costs. Proof of purchase will be required for a warranty claim. All claims must be addressed in writing to LCJ Capteurs. Once this has been accepted by LCJ Capteurs, the defective product must be sent to the LCJ Capteurs address in Vertou, France.

For more information, please visit www.lcjecapteurs.com where video presentations are available.



EN 55022 EN 55024



Electronic equipment marked with the recycling symbol must be handed over to a recognised recycling agency. They can be returned to the manufacturer with agreement. Do not mix electronic equipment with household or industrial waste.