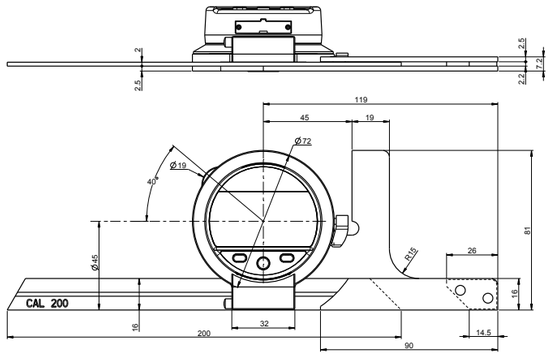
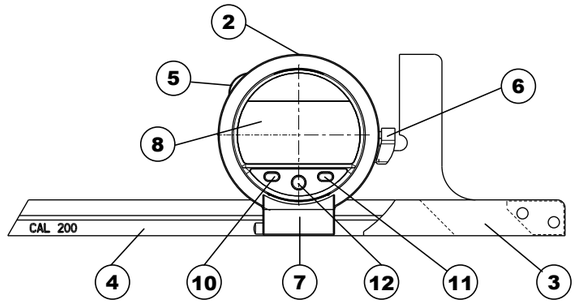
Installing and replacing the battery

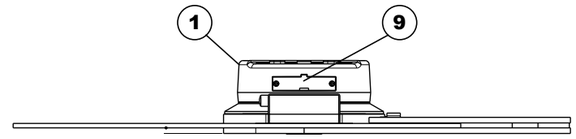


Outline dimension drawing



General description





1. Electronic module
2. Proximity entry
3. Reference blade
4. Rotating blade
5. Fine adjustment
6. Lock nut
7. Blade clamping plate
8. Multifunctional display
9. Pull-out slide for battery
10. Mode button
11. Set button (ON/OFF)
12. Favourite key

Operating features of the instrument

- MODE — The instrument has two operating modes: first level functions (direct access) and second level functions. In addition to the configuration functions, 3 different measuring modes can be accessed, in MIN, MAX and DELTA (TIR) mode (depends on model), plus tolerance display. (see «Basic and Second level functions»)
- ◈ — The «favourite» key gives direct access to the function used most often (see «Favourite Key»)
- SET — Sets a Preset value, reset the MIN/MAX mode, verifies a selection, and controls switching off the instrument. By default, SIS mode enables automatic switch-off with no loss of origin (see «Switching off»)

- Personalising the functions

It is possible to activate or de-activate certain functions of the instrument via RS232 (PC) (see «Personalising the instrument»)

- Data transmission parameters

4800Bds, 7 bits, even parity, 2 stop bits

- Start *Bluetooth*® connection see «Bluetooth® configuration» (depends on model)

Bluetooth® configuration (depends on model)

The connection procedure has been designed to be simple and is signalled by the following three states :

off	disconnected mode
blinking	advertising mode
on	connected mode
rESEt	clear pairing information
MAC	Display the MAC (Media Access Control) address.
SIMPLE	profile without pairing (dafault)
PAIr	paired and secured profile
HId	virtual keyboard (compatible with recent equipement without driver installation)

Connection :
1° Activate Bluetooth® compatible software and hardware (Master : PC, Display Unit).
2° Start the instrument. By default the Bluetooth® module is active and the instrument is available for connection (advertising mode).
3° If no connnection is established during the advertisement period reactivate the Bluetooth® module using the bt / On menu.
4° Instrument is ready to communicate (connected mode.)

Only with paired profile :

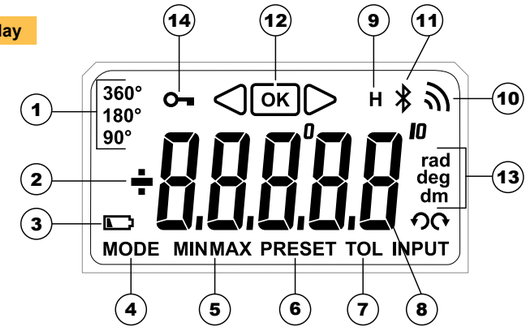
Pairing with master is automatically done at first connection.
To connect the instrument to a new master (new pairing), pairing information on the instrument must be cleared using the bt / rESEt menu.

Bluetooth® specifications

Frequency Band	2.4GHz (2.402 - 2.480GHz)
Modulation	GFSK (Gaussian Frequency Shift Keying)
Max Output Power	Class 3: 1mW (0dBm)
Range	Open space: up to 15m Industrial environment: 1-5m
Battery life	Continuous : up to 2 months - Always connected with 4 values /sec. Saver : up to 5 months - The instrument sends value only when the position has changed. Blind/Push : up to 7 months - Value is sent from the instrument (button) or requested from the computer.

Other specifications on the manufacturer's website

Display

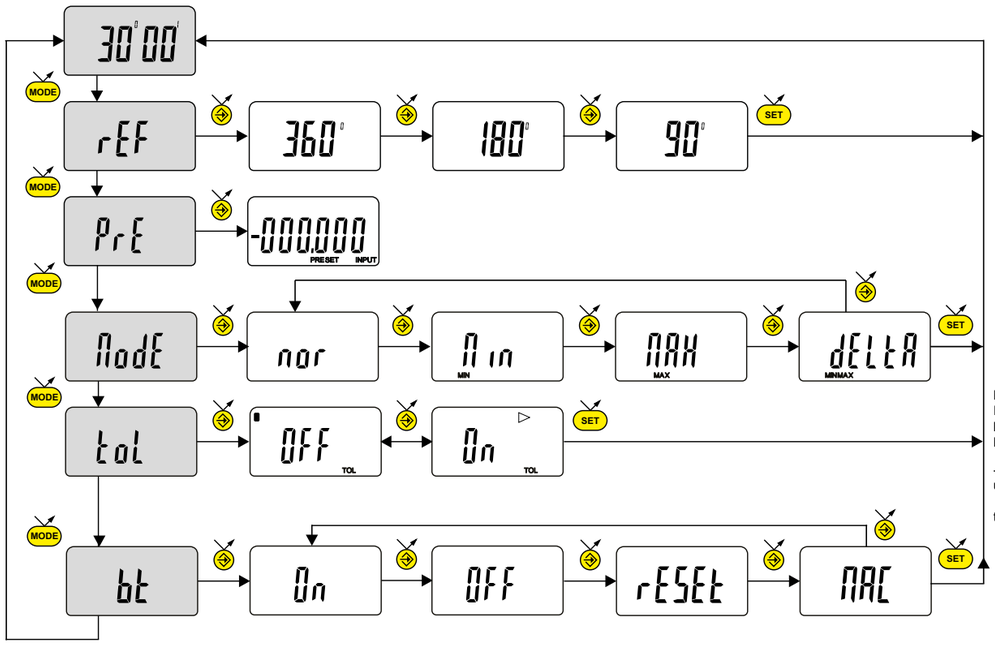


1. Indicator of measuring range (90°/180°/360°) / **2. +/- Indicator** / 3. Low battery
4. Mode menu display / 5. MIN/MAX/DELTA mode / 6. **Preset mode** / 7. Tolerance mode
8. 5-digit display / 9. Hold measured value / **10. Send data** / 11. *Bluetooth*® active (depends on model) / **12. Tolerance indicators** / 13. Measurement units (rad/deg/dm)
14. Keypad lock

Press a button.

First level functions

Each short press on MODE gives direct access to the first level functions :



Note :
It is also possible to display the tolerance limits when the instrument is operating in MIN, MAX or DELTA (TIR) mode.

- If no tolerance limits have been defined by the user, the instrument will display the tolerance limit indicators ◁ OK ▷, but will not turn on the green indicator light.

rEF : choice of reference (360°, 180° or 90°) (depends on model)

PrE : Inputting a Preset value

Next digit — SET 0...9 — MODE save Preset

MODE : MIN, MAX measurement, DELTA (tir)

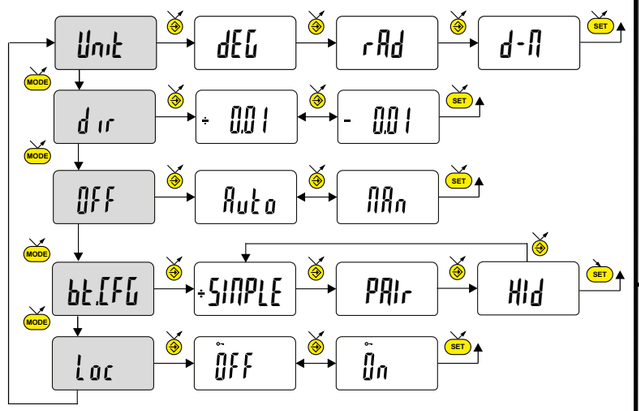
tOL : Tolerance display (inputting tolerance limits, see «Inputting the Tolerance limits»)

bt : activates, deactivates or reset Bluetooth® (depends on model)

Second level functions (depends on model)

Prolonged pressure (>2s) on MODE gives access to the second level functions.

Then, each short press on MODE accesses the required function :



Unit : units selection (dEG, rAd or d-M)

dir : Choice of measurement direction (positive or negative sense, depends on model)

OFF : Automatic switch-off mode (MAn= de-activated, Auto= active (after 10min))

bt.CFG : Bluetooth® profile selection (depends on model)

Loc : Keypad lock. Only the favourite key ◈ remains active

To unlock the keypad, press SET for 5 seconds.

PROTRACTOR



E

User guide

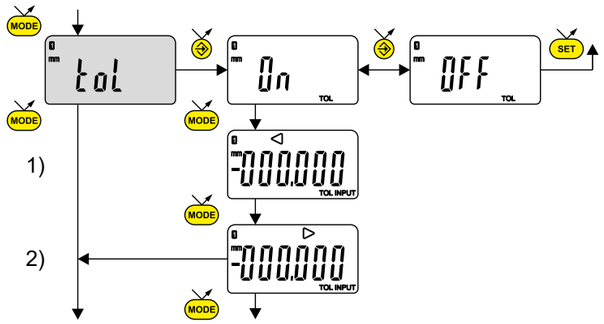
Changes without prior notice

Note: BLUETOOTH® instruments and accessories are only available in countries for which certification has been obtained (UE, USA, JP, CN,TW etc.). Look at our website, www.sylvac.ch, for the list of countries that have obtained certification. If your country is not on the list, please contact your local Sylvac reseller.

Firmware version : 4.05/4.05r 28.06.2018
Edition : 2019.05 / 681.239-200

Inputting tolerance limits

To input or modify the tolerance limits, tol → On mode should be selected, followed by a short press on : MODE



1) Input the lower tolerance limit ◁

2) Inputting the upper tolerance limit ▷

Next digit SET 0...9 MODE save tolerance limits

Note :

Because of 360° rotating system, tolerance indicators work in Go-NoGo mode:

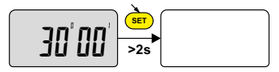
Inside tolerances limits OK (green light)

Outside limits: NoGo indicators ◁ ▷

Switching off

The protractor goes automatically into stand-by if not used for 20 minutes, unless automatic switch-off mode has been turned off (see «Second level functions»)

Stand-by mode can be forced by a prolonged press (> 2 sec) on : SET



In stand-by mode, the value of the origin is retained by the sensor (SIS mode), and the instrument automatically restarts with any movement of the measurement probe, RS command, Bluetooth® request or press a button.

The instrument can be switched off completely for a long period of non-use, but this will necessitate a zero reset on restart (the origin will be lost):

- Prolonged press (>4 sec) on SET



Re-initialising the instrument

The initial instrument settings can be restored at any time by a prolonged press (>4 sec) simultaneously on MODE and SET until the message rESEt is displayed.

Personalising the instrument

Access to the functions of your instrument can be personalised, for more information see manufacturer's website (requires you to connect your instrument via Proximity or Power RS / USB cable, or *Bluetooth*® (depends on model)).

Possibilities :

- Enable or disable the required functions
- Modify access to the second level functions (direct access)

Certificates

The Bluetooth® word mark and logos are registered trademarks owned by the Bluetooth SIG, Inc. and any use of such marks by Sylvac is under license. Other trademarks and trade names are those of their respective owners.

U.S./Canada Certification

Sylvac
m.n : Protractor

This device contains
FCC ID: 2AAQS-ISP091201
IC: 11306A-ISP091201

NOTICE :
Changes or modifications made to this equipment not expressly approved by Sylvac may void the FCC authorization to operate this equipment.

NOTICE :

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions.

Brazil Certification

Description :
This module is based on Nordic Semiconductor nRF8001 µBlue Bluetooth Low Energy Platform. The nRF8001 is a single chip transceiver with an embedded baseband protocol engine, suitable for ultra-low power wireless applications conforming to the Bluetooth Low Energy Specification contained within v4.0 of the overall Bluetooth specification. The nRF8001, used in the current revision of ISP091201, is a production product using a RoM for the baseband protocol engine.

(1) this device may not cause harmful interference, and
Este equipamento opera em caráter secundário, isto é, não tem direito a
proteção contra interferência prejudicial, mesmo de estações do mesmo tipo
e não pode causar interferência a sistemas operando em caráter primário.

ANATEL 00516-14-04534

NOTE :
This equipment has been tested and found to comply with the limits for a Class A
FCC Rules. These limits are designed to provide reasonable protection against
is operated in a commercial environment. This equipment generates, uses, and
not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Mexico certification

Contiene modulo inalambrico
Marca: Sylvac
Modelo: ISP091201D

La operación de este equipo está sujeta a las siguientes dos condiciones: (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

Radiofrequency radiation exposure Information :
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Korea South certification

MSIP-CRM-iNs-ISP091201

Class A Equipment (Industrial Use)

이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

Japan certification

R 001-A06167

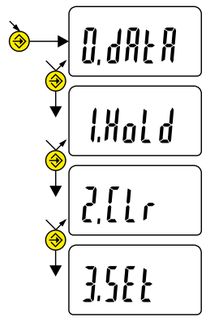
Taiwan certification

CCAH18LP2040T6

警語
經型式認證合格之低功率射頻電機,非經許可,公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
低功率射頻電機之使用不得影響飛航安全及干擾合法通信;經發現有干擾現象時,應立即停用,並改善至無干擾時方得繼續使用。
前項合法通信,指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Favourite key

The «favourite» key gives direct access to a predefined function, and can be configured according to the needs of the user. In order to assign a function to the «favourite» key, give a prolonged press on and then select the required function :

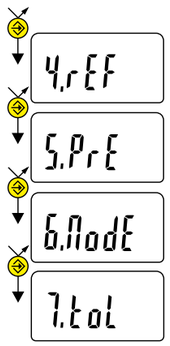


Data transmission (default)

Hold display

Re-initialise Min-Max-Delta

Zero reset

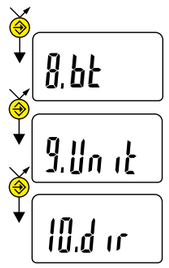


REF1 - REF2 - REF3 (90° - 180° - 360°)

Recall Preset

Nor-Min-Max-Delta (depends on model)

Tol ON - Tol OFF (depends on model)



Bluetooth® (depends on model)

deg - rad - dm

Measurement sense, positive or negative

Validation of selection: By a prolonged press on or a short press on SET or MODE

Note : a function can also be assigned via RS232 using the command <FCT + Function No.> (FCT 0..9, A)
example : Toggle unit = <FCT9>, reverse measuring direction = <FCTA>.

List of the main commands (depends on instrument)

Selection and configuration

CHA+ / CHA-	Change measurement direction
FCT0 ...9...A...F	Assign «favourite» function
DEG / DMIN / RAD	Change measurement unit
KEY0 / KEY1	Lock / unlock keypad
PRE [+/-]xxx.xxx	Modify preset value
REF1 / REF2 / REF3	Change active reference (90°, 180°, 360°)
STO1 / STO0	Activate / de-activate HOLD
TOL1 / TOL0	Activate / de-activate tolerances
ECO1 / ECO 0	Activate / de-activate economic mode
LCAL dd.mm.yy	Modify last calibration date
NCAL dd.mm.yy	Modify next calibration date
NUM x...x (up to 20chars)	Serial number
TOL +/-xxx.xxx +/-yyy.yyy	Inputting tolerance limits
MIN / MAX / DEL / NOR	Selecting MIN, MAX, Delta, Normal mode
CLE	Re-initialisation of MIN, MAX or Delta
UNI1 / UNI0	Activate / de-activate change of units
OUT1 /OUT0	Activate / de-activate contin. data transmission
PRE ON / PRE OFF	Activate / de-activate Preset function
PRE	Recall Preset
SET	Zero reset
SBY xx	xx number of minutes before stand-by
BT0/BT1	Activate / de-activate Bluetooth® module
BTRST	Reset pairing information

Interrogation

CHA?	Measurement sense?
FCT?	«favourite» function active?
UNI?	Measurement unit active?
KEY?	Keypad locked?
PRE?	Preset value?
REF?	Reference active?
TOL?	Current tolerance limit values?
ECO?	Current economic mode?
LCAL?	Date of last calibration?
NCAL?	Date of next calibration?
NUM?	Serial number?
?	Current value (mode Tol, value followed by <.=)
MOD?	Active mode (MIN, MAX, Delta or Normal)?
SET?	Main instrument parameters?
ID?	Instrument identification code?
SBY	Put instrument in stand-by (SIS)

Maintenance functions

BAT?	Battery status (BAT1 = OK, BAT0 = low battery)
OFF	Switch-off (wake up using a button or RS)
RST	Re-initialisation of the instrument
SBY	Put instrument in stand-by (SIS)
VER?	Version No. and date of firmware
MAC?	Bluetooth® MAC address ?

Connecting the instrument

The instrument can be connected to a peripheral via a Proximity (RS or USB), Power (RS or USB) cable or *Bluetooth*®. See «installing and replacing the battery» for connecting the Power cable.

Measured values can be transmitted and the instrument driven using predefined commands (see «List of the main commands»)

Note:
In Tolerance mode, the tolerance limit light remains lit only for a few seconds while the measurement stabilises. On the other hand, it will remains lit continuously if the instrument is connected to, and powered by, the Power RS (USB) cable.

PROXIMITY POWER Bluetooth®

Specifications

Measuring range	1x360°, 2x180°, 4x90°
Resolution	0.01° / 1 minute of arc (0°01') / 0.0001rad
Accuracy	4 minutes of arc / 0.06° / 0.0012 rad
Repeatability	0.01°
Maximum operation speed	1080° / s
Display refresh rate	8 / s
Measuring unit	deg / rad / deg-min
Measuring system	Sylvac Inductive System (patented)
Stand-by SIS (automatic after 10')	movement or command
Power	Bluetooth® capacity min. 220mAh Bluetooth® capacity type CR2032, 3 Volt, 240 mAh
Working temperature	0...40°C / 32...104°F
Battery life	Average battery life: 7 000 hours / on model, see chapter Bluetooth®
Output	Compatible RS232, Proximity configuration)
Protection according to IEC 529	IP51 (IEC 529)
Weight	410g

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www.sylvac.ch

EU DECLARATION OF CONFORMITY (DoC)

We, Sylvac SA, hereby declare under our sole responsibility that the product

Name	Protractor V2 BT
Description	Protractor with Bluetooth® wireless technology
Part Numbers	820.1706

has been submitted to a conformity assessment and fulfils the essential requirements of the following European directives

2001/95/EC	General product safety
2014/30/EU	EMC
2011/65/EU & 2015/863/EU	RoHS
2014/53/EU	Radio Equipment Directive (RED)

and complies with the following harmonized standards or other normative documents

EN 61326-1:2013	Electrical equipment for measurement, control and laboratory use – EMC requirements
EN 50581:2012	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
EN 300 328 V1.7.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems

Person authorized to compile the technical file and issue the declaration of conformity: Eric Schnyder

Place and date of issue	Yverdon-Les-Bains, September 12, 2019
Name (position)	Eric Schnyder (CEO)
Signature	