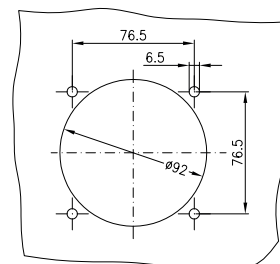
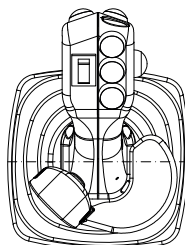
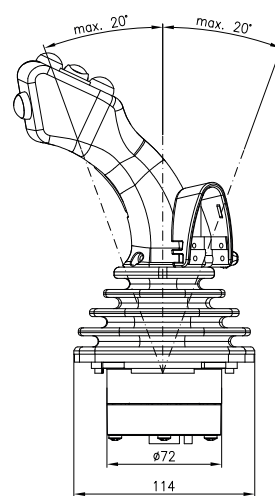
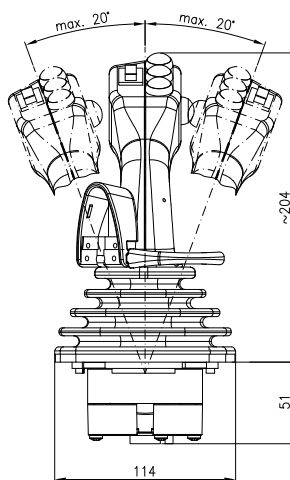
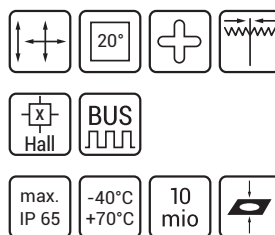


HS2

3D-Hall-Technology for highest demands.



This joystick was developed especially for applications with bus systems. The wear-free 3D Hall sensor system allows a control system up to at least 10 million operating cycles.

In addition to a Spobu-typical stable ferromagnetic metal body, the low installation depth and the 12mm lever diameter are characteristics of this new joystick platform. The extremely compact design enables the

installation in small consoles to realize until now not possible console designs.

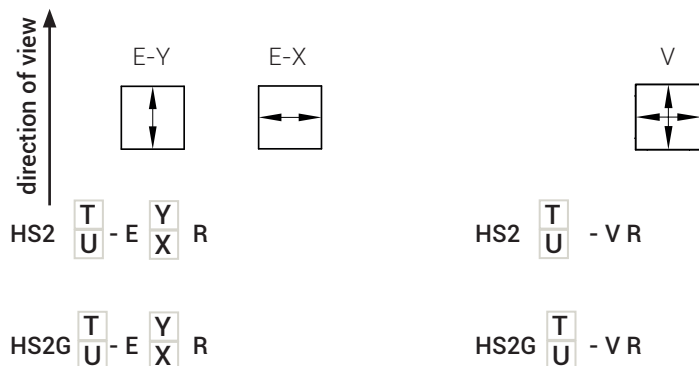
Various gates, end notchings and a variety of handle shapes round off the range of applications. The joystick is used in particular in agricultural and construction equipment and is easily integrated into complex control panels and systems.

Single axis version E

Drive arrangement Y, X

Dual axis version V

Drive arrangement



Scope of supply HS2 basic version:

- Redundant, analogue output A1
- Connections: IP00, micromatch connector without mating plug
- Lever deflection $\pm 20^\circ$ with limiting gate AK
- Lever with preferred guidance W
- Spring return in middle position
- Handle G22, rubber boot
- Installation from top or below
- Technical information see TI-HS2-...

Scope of supply HS2G basic version:

- Redundant, analogue output A1
- Protective housing for electronics
- Analogue output with connection cable length 450 mm
- CANopen, SAEJ1939-71 (option, additional price): Connecting cable length 450 mm
- Profibus-DP (option, additional price): D-Sub connectors in the end plate
- Lever deflection $\pm 20^\circ$ with limiting gate AK
- Lever with preferred guidance W
- Spring return to middle position
- Handle G22, rubber boot
- Technical information see TI-HS2-...

Options

Handle

see combination table G-Ü

Electronic

see sheet E-Electronic-1, 2, 3

- | | |
|---|----|
| • Cross gate | KK |
| • Special gate (please describe) | SK |
| • Without preferred guidance W0 | |
| • Capacitive hand detecting sensor in combination with CANopen, SAEJ1939-71 | KT |
| • Version analogue output A2 | A2 |
| • Electronic | |
| • Wiring to connection cable or plug | |

Type code:

Type code:		AK	A1, A2	Profibus DP
	HS2 T 07 KK E Y W CANopen Profinet I/O			
	HS2G U 09 SK V X R W0 SAEJ1939-71 mA-Output			

The diagram illustrates the construction of a type code by mapping specific product features to their corresponding letters or numbers in the code sequence.

- Type**: Maps to HS2 or HS2G.
- Installation from top (T), below (U)**: Maps to T or U.
- Lever length**: Maps to 07 or 09.
- Limiting-/ Cross-/ special gate**: Maps to KK or SK.
- Drive**: Maps to E or V.
- Drive arrangement**: Maps to Y or X.
- Spring return**: Maps to R.
- Preferred guidance W/without preferred guidance (W0)**: Maps to W or W0.
- Electronic**: Maps to AK.

Installation dimensions

Version	HS2-T	HS2G-T	HS2-U	HS2G-U
Installation from	top	top	below	below
Installation opening	ø 92 mm	ø 92 mm	ø 44 mm	ø 44 mm
Flange dimensions	114 x 114	114 x 114	77 x 77	77 x 77
Installation depth for:	Dimension L2 see sheet TI-HS2-3/4 + 4/4			
A1, A2	L2 = 50 mm	L2 = 65 mm	L2 = 70 mm	L2 = 100 mm
CANopen/SAEJ1939-71	-	L2 = 65 mm	-	L2 = 100 mm
Profibus-DP	-	L2 = 85 mm	-	L2 = 120 mm
ESS149 (current output)	-	L2 = 65 mm	-	L2 = 100 mm
ESS150-A, -B, E (Profinet I/O, Modbus TCP/IP, Ethernet IP)	-	L2 = 92 mm	-	L2 = 120 mm

Note:

Capacitive hand detecting sensor in combination with:

A1, A2	dimension L2 increases
Profibus	dimension L2 increases
ProfiNet	dimension L2 increases
Current output	dimension L2 increases

Mechanical characteristics

Lever deflection	± 20° (limiting gate)
Repeatability middle position	± 1°
Impact force in X- and Y-direction	max. 75 Nm (max. 400 N at 37,5 mm distance from pivot point)
Impact force in Z-direction	± 300 N (compressive and tensile loading)
Life cycle	> 10 million operating cycles under the influence of climate (-40°C to +85°C)
Operating temperature	-40°C bis +70°C
Storage temperature	-50°C bis +90°C
Protection from above with standard handle	IP65
Flame class UL94	HB

Electrical characteristics

Sensor-system

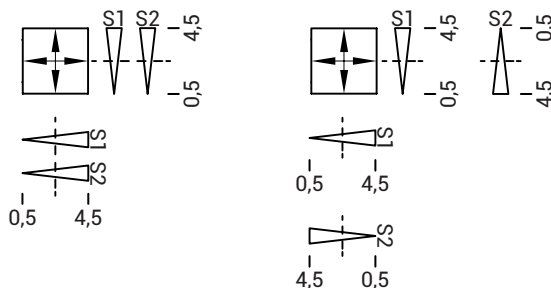
Sensor type
Resolution
Linearity
Interfering magnetic fields

fully redundant Dual-Die 3D-Hall
8-Bit (at 20° lever deflection)
max. +3% rel. linearity
EN61000-4-8 Level 5

Analogue output

Operating voltage U_B
Current consumption
Load
Operating temperature
Output signal

A1	A2
5 VDC \pm 0,5	5 VDC \pm 0,5
< 35 mA	< 35 mA
> 10 k Ω	> 10 k Ω
-40°C to +70°C	-40°C to +70°C
0,5 ... 4,5 V ratiom.	0,5 ... 4,5 V ratiom.
redundant, same direction	redundant, inverse
Example: V-drive	Example: V-drive



Output signal, middle position

2,5 V \pm 0,1 V

2,5 V \pm 0,1 V

Connection plan:

Description	Pin	colour lead wire
Supply voltage 1	1	red
GND 1	2	brown
Signal S1, x-axis	3	blue
Signal S1, y-axis	7	violet
Supply voltage 2	5	orange
GND 2	6	black
Signal S2, x-axis	4	green
Signal S2, y-axis	8	yellow

Bus-interfaces (only with HS2G)

Operating voltage U_B
Current consumption
Operating temperature
Galvanic isolation (CAN- U_B)
Input for:

CANopen

10 to 36 VDC
< 100 mA
-25°C to +70°C
yes
2 axis joystick with full redundant
Dual-Die 3D-HALL-Sensor
2 analogue inputs for potentiometer
12 digital inputs

SAEJ1939-71

10 to 36 VDC
< 100 mA
-25°C to +70°C
yes

ProfiBus-DP

10 to 30 VDC
< 110 mA
-25°C to +70°C
-

More technical
informationen see
TI-ProfiBus-1

Output

Potential free zero contact
Terminating resistor

Electronic
Connection type

-	-
1x relay with change over contact may be activated on site	
encapsulated	encapsulated
0,4 m cable	0,4 m cable
with D-Sub-plug	with Deutsch-plug

encapsulated
D-Sub-plug in
end plate

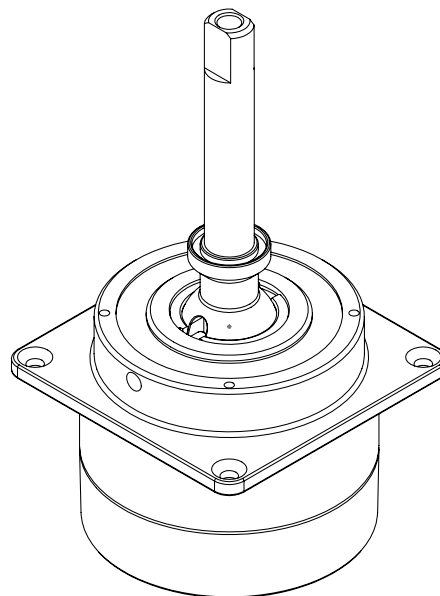
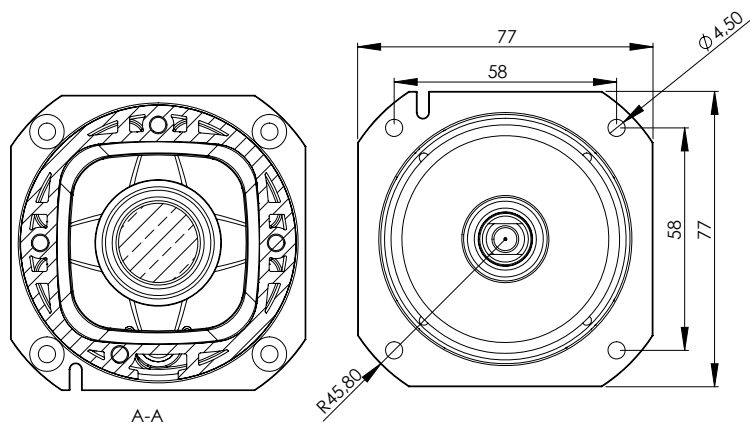
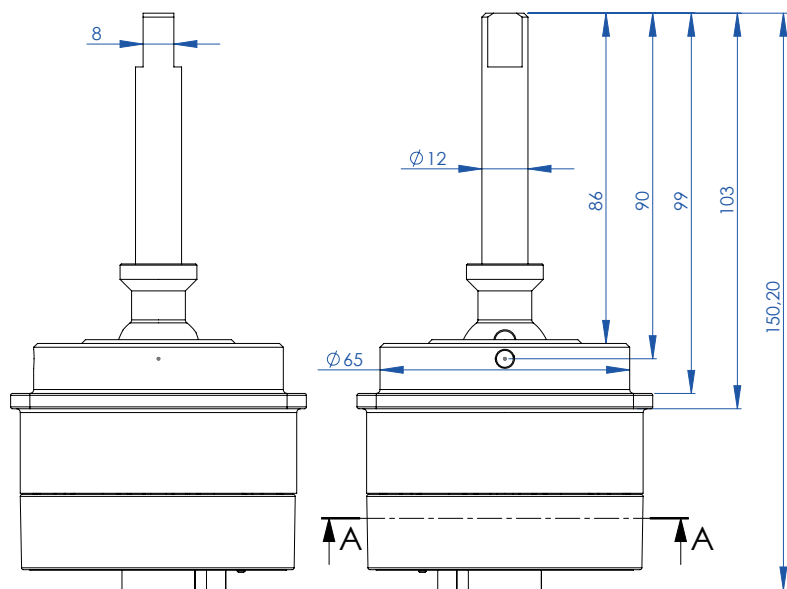
Optional

capacitive hand detection sensor

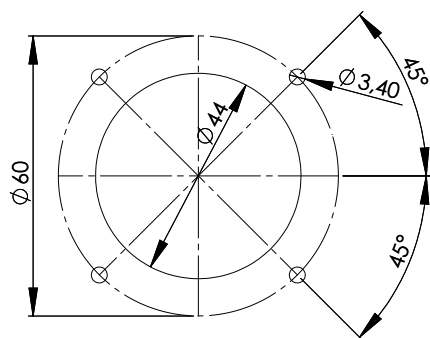
-

Version:

Installation from below

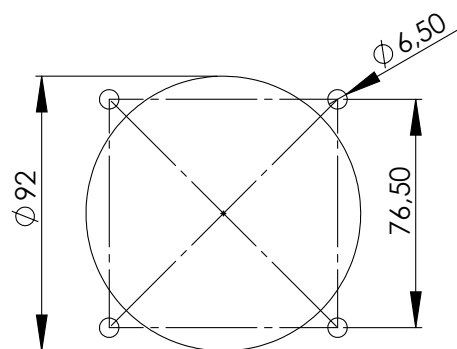
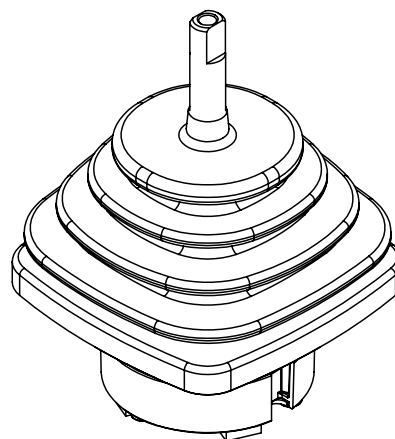
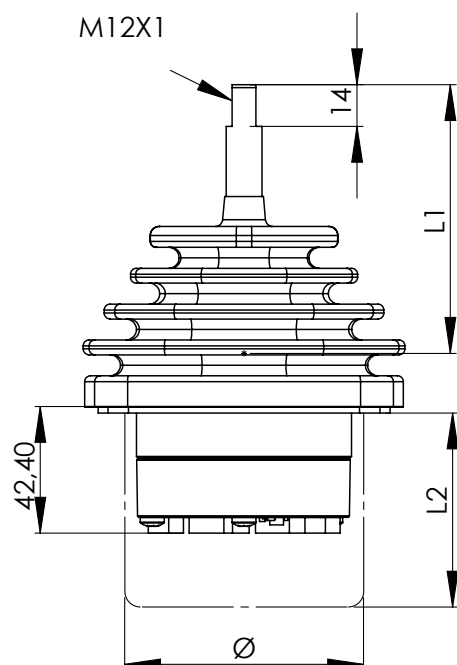


Drilling pattern for:
HS2 installation from below with or without holding ring.

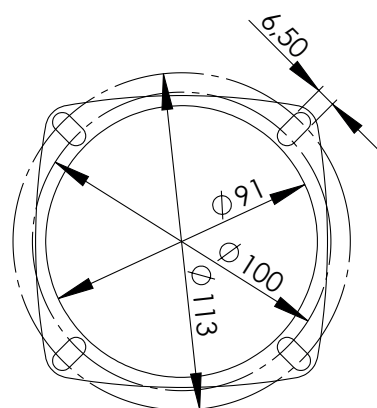


Version:

Installation from top



Drilling pattern HS2 / NS3



Drilling pattern 100 to 113 hole circle

