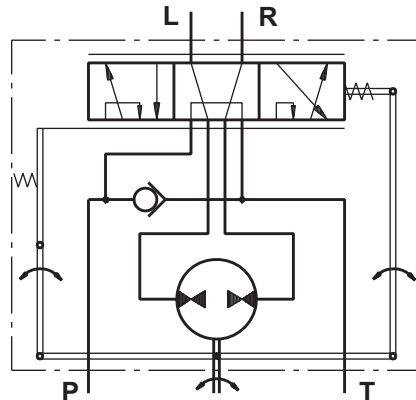


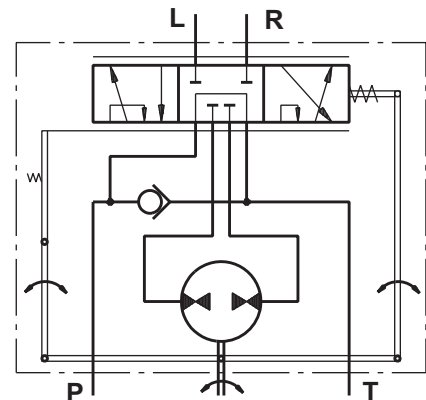
HYDROSTATIC STEERING UNITS TYPE HKU.../3, 4



The newly designed HKU steering units, with radial distribution, incorporate two rotary tracing valves in the housing, which turn on the metering pump.



"Open Center - Load Reaction"
HKU.../3



"Open Center - Non Load Reaction"
HKU.../4

SPECIFICATION DATA

| Parameters | | Type | | | | | | | | | | | | | | | |
|------------------------------------|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------|-----------------|-----------------|-----------------|-----------------|---------------|------------------|-----------------|------------------|--|
| | | HKU 40/3 | HKU 50/3 | HKU 63/3 | HKU 80/3 | HKU 100/3 | HKU 125/3 | HKU 160/3 | HKU 200/3 | HKU 250/3 | HKU 320/3 | HKU 400/3 | | | | | |
| | | HKU 40/4 | HKU 50/4 | HKU 63/4 | HKU 80/4 | HKU 100/4 | HKU 125/4 | HKU 160/4 | HKU 200/4 | HKU 250/4 | HKU 320/4 | HKU 400/4 | HKU 500/4 | HKU 630/4 | HKU 800/4 | HKU 1000/4 | |
| | | | | | | | | | | | | | | | | | |
| Displacement | cm ³ /rev [in ³ /rev] | 39,6 [2.42] | 49,5 [3.0] | 65,6 [4.0] | 79,2 [4.83] | 99,0 [6.04] | 7.56 [123,8] | 9.67 [158,4] | 198 [12.1] | 247,5 [15.1] | 316,8 [19.3] | 396 [24.2] | 495 [30.2] | 623,6 [38.05] | 793 [48.4] | 990 [60.4] | |
| Rated Flow* | lpm [GPM] | 4 [1.1] | 5 [1.3] | 6 [1.6] | 8 [2.1] | 10 [2.6] | 13 [3.4] | 16 [4.2] | 20 [5.3] | 25 [6.6] | 32 [8.4] | 40 [10.6] | 50 [13.2] | 63 [16.6] | 70 [18.5] | | |
| Rated Pressure | bar [PSI] | 140 [2030] | | | 170 [2465] | | | | | | | | 140 [2030] | | 100 [1450] | | |
| Max. Cont. Pressure in Line T | bar [PSI] | | | | | | | | | | | | | | | | |
| - standard | | 25 [363] | | | | | | | | | | | | | | | |
| - high pressure (H option) | | 40 [580] | | | | | | | | | | | | | | | |
| Max. Torque at Servoamplifying | Nm [lb-in] | | | | | | | 3,0 [26] 1,8 [16] | | | | | | | | | |
| - with standard springs | | | | | | | | | | | | | | 3,0 [26] | | | |
| - with soft springs (LT option) | | | | | | | | | | | | | | | | | |
| Max. Torque w/o Servoamplifying | Nm [lb-in] | 120 [1065] | | | | | | | | | | | | | | | |
| Weight | kg [lb] | 5,3 [11.7] | 5,4 [11.9] | 5,5 [12.2] | 5,6 [12.4] | 5,7 [12.6] | 5,8 [12.8] | 6,0 [13.2] | 6,3 [13.9] | 6,5 [14.3] | 7,0 [15.4] | 7,4 [16.3] | 8,0 [17.6] | 8,7 [19.2] | 9,6 [21.2] | 10,6 [23.4] | |
| Dimension A | mm [in] | 130,85 [5.1] | 132,2 [5.20] | 133,9 [5.27] | 136,2 [5.36] | 138,8 [5.47] | 142,2 [5.60] | 146,8 [5.78] | 152,2 [5.99] | 158,8 [6.25] | 168,2 [6.62] | 178,8 [7.04] | 192 [7.56] | 209,3 [8.24] | 232,2 [9.14] | 258,6 [10.18] | |

* Inlet flow providing maximum speed of rotation:

- 100 RPM - from HKU40 to HKU630;
- 87 RPM - for HKU800;
- 70 RPM - for HKU1000.

HYDROSTATIC STEERING UNIT TYPE HKU.../7

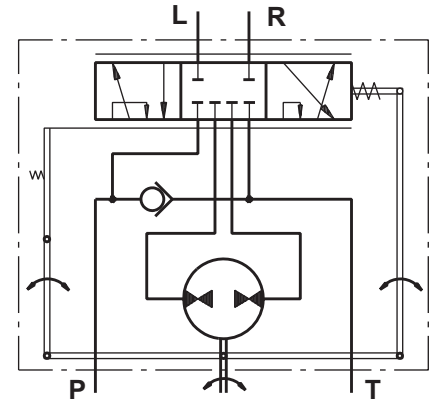


The HKU.../7 is a "Closed Center - Non Load Reaction" hydrostatic steering unit, designed for integration into systems with built-in hydroaccumulator, achieving minimal energy losses.

When connecting to a differential cylinder the L and R ports of the steering unit must be connected as follows: L to the greater piston area, and R - to the smaller one.

For the "Closed Center - Non Load Reaction" and "Closed Center - Non Reaction and Load Sensing" steering units is possible to observe Thermal Shock - condition caused when the hydraulic system has operated for some time without turning the steering wheel, causing the fluid in the reservoir and

the system to heat up while the steering unit is relatively cool (i.e. there is more than 500F [100C] difference in the temperature). If, under the condition of Thermal Shock, the steering wheel is turned very quickly, it is possible to experience temporary seizure and have the internal parts of the steering unit damaged. The temporary seizure may be followed by a total free wheeling.



"Closed Center - Non Load Reaction"
Version 7 - HKU.../7

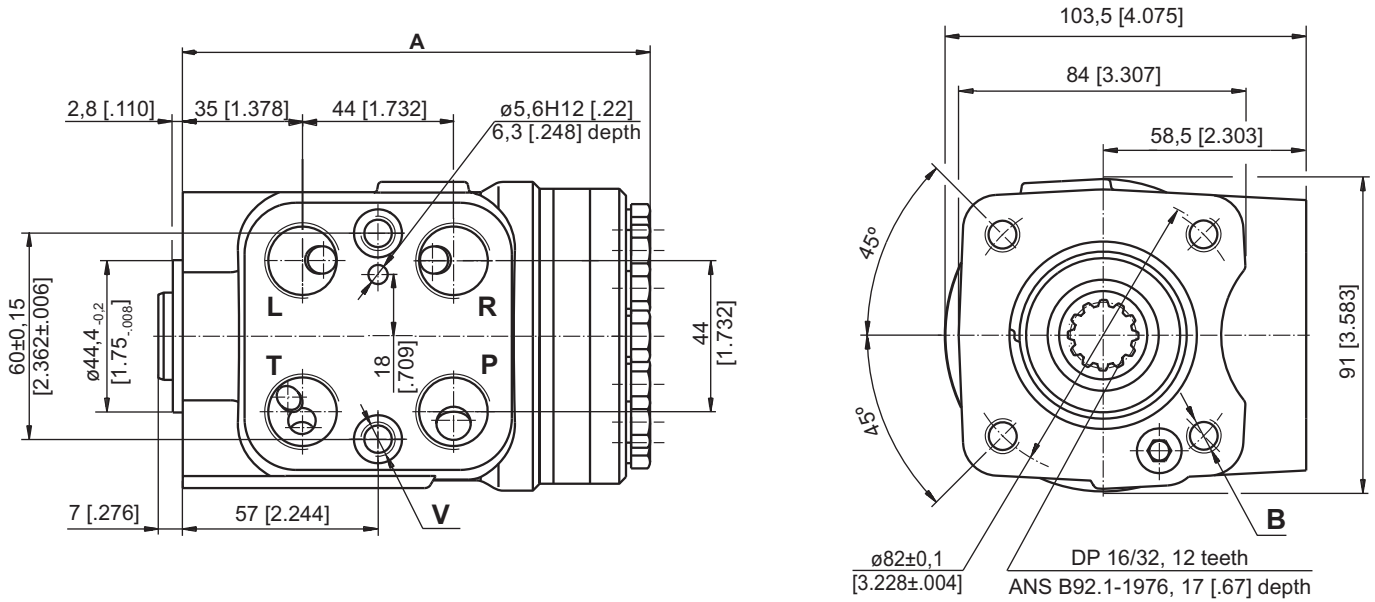
SPECIFICATION DATA

| Parameters | Type | | | | | | | | | | | | | | | |
|------------------------------------|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------|------------------|-----------------|--|
| | HKU 40/7 | HKU 50/7 | HKU 63/7 | HKU 80/7 | HKU 100/7 | HKU 125/7 | HKU 160/7 | HKU 200/7 | HKU 250/7 | HKU 320/7 | HKU 400/7 | HKU 500/7 | HKU 630/7 | HKU 800/7 | | |
| Displacement | cm ³ /rev [in ³ /rev] | 39,6 [2.42] | 49,5 [3.0] | 65,6 [4.0] | 79,2 [4.83] | 99,0 [6.04] | 123,8 [7.56] | 158,4 [9.67] | 198 [12.1] | 247,5 [15.1] | 316,8 [19.3] | 396 [24.2] | 495 [30.2] | 623,6 [38.05] | 793 [48.4] | |
| Rated Flow* | lpm [GPM] | 4 [1.1] | 5 [1.3] | 6 [1.6] | 8 [2.1] | 10 [2.6] | 13 [3.4] | 16 [4.2] | 20 [5.3] | 25 [6.6] | 32 [8.4] | 40 [10.6] | 50 [13.2] | 63 [16.6] | 80 [21.1] | |
| Rated Pressure | bar [PSI] | 125 [1810] | 140 [2030] | 175 [2540] | | | | | | | | | | | | |
| Max. Cont. Pressure in Line T | bar [PSI] | | | | | | | | | | | | | | | |
| - standard | | 25 [363] | | | | | | | | | | | | | | |
| - high pressure (H option) | | 40 [580] | | | | | | | | | | | | | | |
| Max. Torque at Servoamplifying | Nm [lb-in] | | | | | | | 3,0 [26] | | | 3,0 [26] | | | | | |
| - with standard springs | | | | | | | | 3,0 [26] | | | 3,0 [26] | | | | | |
| - with soft springs (LT option) | | | | | | | | 1,8 [16] | | | - | | | | | |
| Max. Torque w/o Servoamplifying | Nm [lb-in] | 120 [1065] | | | | | | | | | | | | | | |
| Weight | kg [lb] | 5,3 [11.7] | 5,4 [11.9] | 5,5 [12.2] | 5,6 [12.4] | 5,7 [12.6] | 5,8 [12.8] | 6,0 [13.2] | 6,3 [13.9] | 6,5 [14.3] | 7,0 [15.4] | 7,4 [16.3] | 8,0 [17.6] | 8,7 [19.2] | 9,6 [21.2] | |
| Dimension A | mm [in] | 130,8 [5.15] | 132,2 [5.20] | 133,9 [5.27] | 136,2 [5.36] | 138,8 [5.47] | 142,2 [5.60] | 146,8 [5.78] | 152,2 [5.99] | 158,8 [6.25] | 168,2 [6.62] | 178,8 [7.04] | 192 [7.56] | 209,3 [8.24] | 232,2 [9.14] | |

* Inlet flow providing maximum speed of rotation:

- 100 RPM - from HKU40 to HKU630;
- 87 RPM - for HKU800.

DIMENSIONS AND MOUNTING DATA - HKU.../3, 4, 7



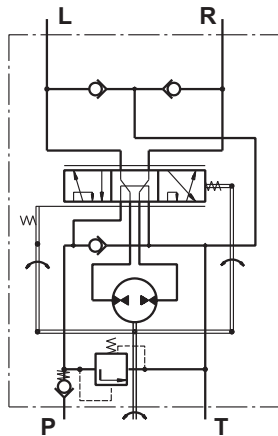
| Code | Ports - P, T, R, L Thread | Column Mounting Thread - B | Valve Mounting Thread - V |
|------|--|--------------------------------------|--------------------------------------|
| - | G1/2 17 [.67] depth | 4 x M10 18 [.71] depth | 2 x M10x1 16 [.63] depth |
| M | M22x1,5 17 [.67] depth | 4 x M10 18 [.71] depth | 2 x M10x1 16 [.63] depth |
| A | 3/4 - 16 UNF O-ring 17 [.67] depth | 4 x 3/8 - 16 UNC 15,7 [.62] depth | 2 x 3/8 - 24 UNF 14,2 [.56] depth |
| BA* | 9/16 - 18 UNF O-ring 17 [.67] depth | 4 x 3/8 - 16 UNC 15,7 [.62] depth | 2 x 3/8 - 24 UNF 14,2 [.56] depth |

* These threads are for displacements from HKU40 to HKU200 only.

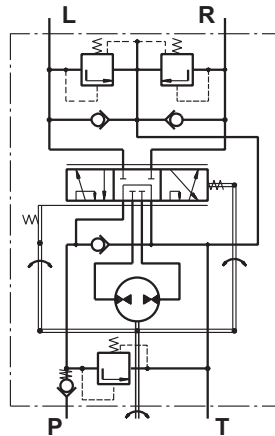
HYDROSTATIC STEERING UNITS TYPE HKUS.../3, 4, 8



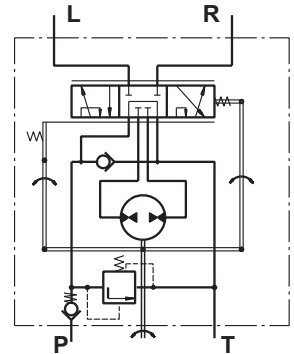
The HKUS Hydrostatic Steering unit is based on the HKU unit but has built-in relief and check valves. Thus M+S Hydraulic achieves one very compact steering unit which reduces the need for additional hydraulic components in the system.



"Open Center - Load Reaction"
HKUS.../3



"Open Center - Non Load Reaction"
HKUS.../4



"Open Center - Non Load Reaction"
HKUS.../8

SPECIFICATION DATA

| Parameters | Type | | | | | | | | | | | | |
|------------------------------------|--|----------------------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------|
| | HKUS 40/3,4,8 | HKUS 50/3,4,8 | HKUS 63/3,4,8 | HKUS 80/3,4,8 | HKUS 100/3,4,8 | HKUS 125/3,4,8 | HKUS 160/3,4,8 | HKUS 200/3,4,8 | HKUS 250/3,4,8 | HKUS 320/3,4,8 | HKUS 400/3,4,8 | HKUS 500/3,4,8 | |
| Displacement | cm ³ /rev [in ³ /rev] | 39,6 [2.42] | 49,5 [3.0] | 65,6 [4.0] | 79,2 [4.83] | 99,0 [6.04] | 123,8 [7.56] | 158,4 [9.67] | 198 [12.1] | 247,5 [15.1] | 316,8 [19.3] | 396 [24.2] | 495 [30.2] |
| Rated Flow* | lpm [GPM] | 4 [1.1] | 5 [1.3] | 6 [1.6] | 8 [2.1] | 10 [2.6] | 13 [3.4] | 16 [4.2] | 20 [5.3] | 25 [6.6] | 32 [8.4] | 40 [10.6] | 50 [13.2] |
| Rated Pressure | bar [PSI] | 140 [2030] | | | 170 [2465] | | | | | | | | |
| Relief Valve Pressure | | 80 | | | 100 | 125 | 150 | 170 | | | | | |
| Settings** | bar [PSI] | [1160] | | | [1450] | [1810] | [2175] | [2465] | | | | | |
| Shock Valves Pressure | | 140 | | | 160 | 180 | 200 | 220 | | | | | |
| Settings*** | bar [PSI] | [2030] | | | [2320] | [2610] | [2900] | [3190] | | | | | |
| Max. Cont. Pressure in Line T | bar [PSI] | - | | | | | | | | | | | |
| - standard | | 25 [363] (50 [725] by HKUS.../8) | | | | | | | | | | | |
| - high pressure (H option) | | 40 [580] | | | | | | | | | | | |
| Max. Torque at Servoamplifying | Nm [lb-in] | - | | | | | | 3,0 [26] | | | | | |
| - with standard springs | | 3,0 [26] | | | | | | - | | | | | |
| - with soft springs (LT option) | | 1,8 [16] | | | | | | - | | | | | |
| Max. Torque w/o Servoamplifying | Nm [lb-in] | 120 [1065] | | | | | | | | | | | |
| Weight | kg [lb] | 5,3 [11.7] | 5,4 [11.9] | 5,5 [12.2] | 5,6 [12.4] | 5,7 [12.6] | 5,8 [12.8] | 6,0 [13.2] | 6,3 [13.9] | 6,5 [14.3] | 7,0 [15.4] | 7,4 [16.3] | 8,0 [17.6] |
| Dimension A | mm [in] | 130,8 [5.15] | 132,2 [5.20] | 133,9 [5.27] | 136,2 [5.36] | 138,8 [5.47] | 142,2 [5.60] | 146,8 [5.78] | 152,2 [5.99] | 158,8 [6.25] | 168,2 [6.62] | 178,8 [7.04] | 192 [7.56] |

* Rated Flow at 100 RPM.

** Pressure Settings are at Rated Flow (as in the table) and viscosity 21 mm²/s [105 SUS] at 50°C [122°F].

*** Pressure Settings are at flow rate of 2 lpm [.53 GPM] and viscosity 21 mm²/s [105 SUS] at 50°C [122°F].

STEERING UNITS

ORDER CODE

| | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| HKU | | / | - | | | | | |

Pos.1 - Displacement code (see Specification Data)

- 40** - 39,6 cm³/rev [2.42 in³/rev]
- 50** - 49,5 cm³/rev [3.00 in³/rev]
- 63** - 65,6 cm³/rev [4.00 in³/rev]
- 80** - 79,2 cm³/rev [4.83 in³/rev]
- 100** - 99,0 cm³/rev [6.04 in³/rev]
- 125** - 123,8 cm³/rev [7.56 in³/rev]
- 160** - 158,4 cm³/rev [9.67 in³/rev]
- 200** - 198,0 cm³/rev [12.10 in³/rev]
- 250** - 247,5 cm³/rev [15.10 in³/rev]
- 320** - 316,8 cm³/rev [19.30 in³/rev]
- 400** - 396,0 cm³/rev [24.20 in³/rev]
- 500** - 495,0 cm³/rev [30.20 in³/rev]
- 630** - 623,6 cm³/rev [38.05 in³/rev]
- 800** - 793,0 cm³/rev [48.40 in³/rev]
- 1000** - 990,0 cm³/rev [60.40 in³/rev]

Pos.2 - Versions

- 3** - Version 3 "Open Center - Load Reaction"
- 4** - Version 4 "Open Center - Non Load Reaction"
- 7** - Version 7 "Closed Center - Non Load Reaction"

Pos.3 - Ports

- omit - BSPP (ISO 228)
- M** - Metric (ISO 262)
- A** - SAE (ANSI B 1.1 - 1982)
- BA*** - SAE (ANSI B 1.1 - 1982)

Pos.4 - Max. Cont. Pressure in line T

- omit - Standard
- H** - High pressure

Pos.5 - Input torque

- omit - Standard
- LT*** - Low

Pos.6 - Noise level

- omit - Standard
- LN*** - Low

Pos.7 - Option (Paint)***

- omit - No Paint
- P** - Painted
- PC** - Corrosion Protected Paint
- PS** - Special Paint****
- PCS** - Special Corrosion Protected Paint****

Pos.8 - Design Series

- omit - Factory specified

Notes:
 * Available only for displacement from 40 to 200.
 ** Available only for versions 3 and 4 with displacement from 40 to 200.
 *** Colour at customer's request.
 **** Non painted feeding surfaces, colour at customer's request.

The steering units are mangano-phosphatized as standard.

ORDER CODE

| | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| HKUS | | / | - | - | | | | | |

Pos.1 - Displacement code (see Specification Data)

- 40** - 39,6 cm³/rev [2.42 in³/rev]
- 50** - 49,5 cm³/rev [3.00 in³/rev]
- 63** - 65,6 cm³/rev [4.00 in³/rev]
- 80** - 79,2 cm³/rev [4.83 in³/rev]
- 100** - 99,0 cm³/rev [6.04 in³/rev]
- 125** - 123,8 cm³/rev [7.56 in³/rev]
- 160** - 158,4 cm³/rev [9.67 in³/rev]
- 200** - 198,0 cm³/rev [12.10 in³/rev]
- 250** - 247,5 cm³/rev [15.10 in³/rev]
- 320** - 316,8 cm³/rev [19.30 in³/rev]
- 400** - 396,0 cm³/rev [24.20 in³/rev]
- 500** - 495,0 cm³/rev [30.20 in³/rev]

Pos.2 - Versions

- 3** - Version 3 "Open Center - Load Reaction"
- 4** - Version 4 "Open Center - Non Load Reaction"
- 8** - Version 8 "Open Center - Non Load Reaction"

Pos.3 - Relief Valve Pressure Settings, bar

80, 100, 125, 150, 170

Pos.4 - Ports

- omit - BSPP (ISO 228)
- A** - SAE (ANSI B 1.1 - 1982)
- M** - Metric (ISO 262)

Pos.5 - Max. Cont. Pressure in line T

- omit - Standard
- H** - High pressure

Pos.6 - Input torque

- omit - Standard
- LT*** - Low

Pos.7 - Noise level

- omit - Standard
- LN*** - Low

Pos.8 - Option (Paint)***

- omit - No Paint
- P** - Painted
- PC** - Corrosion Protected Paint
- PS** - Special Paint****
- PCS** - Special Corrosion Protected Paint****

Pos.9 - Design Series

- omit - Factory specified

| Version | Manual Steering Check Valve | Relief Valve | Inlet Check Valve | Cylinder Relief Valve | Anti-Cavitation Valve |
|---------|-----------------------------|--------------|-------------------|-----------------------|-----------------------|
| 3 | • | • | • | | • |
| 4 | • | • | • | • | • |
| 8 | • | • | • | | |

Notes:
 * Available only for displacement from 40 to 200.
 ** Colour at customer's request.
 *** Non painted feeding surfaces, colour at customer's request.

The steering units are mangano-phosphatized as standard.