K220LS
Mobile Directional Control Valve
Proportional, load sensing, pressure pre-compensated
Catalogue layout

This catalogue has been designed to give a brief overview of K220LS valves, and to make it easy for you to study and choose from the different options available, so that we can customise your valve in accordance with your wishes. In addition to general information and basic technical data, the catalogue therefore contains descriptions of the options available for various so-called “function areas” of the valve.

Each function area is given as a subheading, followed by a brief description. When options are available for a function area, the subheading is followed by an “item number” in brackets, e.g. Pressure relief valve [16]. This is followed by a series of coded options, e.g. PA1, Y, together with a brief description of what each code represents. Alternatively, one or more pressure, flow or voltage options are given.

There is a general hydraulic schematic with basic functions for a K220LS valve, with the item numbers and letter codes that represent them. Naturally, the same item numbers and letter codes are used elsewhere in the catalogue in the relevant function area description. All sub-circuit schematics have been extracted from the general schematic. The terms first valve and subsequent valves are used in several places in the catalogue. These terms are defined as follows:

First valve = In a multivalve system, it is the load signal from the inlet section in the first valve which is connected to the pump regulator.

Following valves = Other valves in a multivalve system in which the load signal to the pump regulator is connected to the first valve.

How to order your valve

Each K220LS valve is constructed according to your particular wishes. Parker has a configurator which configures the valve following selection of the desired functions.

Each configuration generates a unique product name. This is the name which appears on the product nameplate. The configurations are saved so it is easy to find out how the valve is configured for reordering or servicing.

The configurator also produces a report describing the valve, with a hydraulic schematic.

We reserve the right to make changes.

The curves and charts in the catalogue are only typical curves.

The catalogue contents are regularly updated, but there may still be inaccuracies.

For additional information, contact Parker Hannifin.

WARNING - USER RESPONSIBILITIES

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Offer of sale

Please contact your Parker representation for a detailed “Offer of sale”.

Parker Hannifin
Mobile Hydraulics Division Europe
Borås, Sweden
<table>
<thead>
<tr>
<th>Content</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information</td>
<td>4</td>
</tr>
<tr>
<td>Technical data</td>
<td>5</td>
</tr>
<tr>
<td>[P03-P09] General</td>
<td>6-7</td>
</tr>
<tr>
<td>Hydraulic schematic</td>
<td>8-9</td>
</tr>
<tr>
<td>Inlet section</td>
<td>10</td>
</tr>
<tr>
<td>[P10-P29] Inlet</td>
<td>10</td>
</tr>
<tr>
<td>[P12] Internal pilot pressure supply</td>
<td>11</td>
</tr>
<tr>
<td>[P13] Pilot pressure</td>
<td>11</td>
</tr>
<tr>
<td>[P14] Pilot filter</td>
<td>11</td>
</tr>
<tr>
<td>[P15] Inlet section types</td>
<td>11</td>
</tr>
<tr>
<td>[P16] Pressure relief valve</td>
<td>12</td>
</tr>
<tr>
<td>[P17] Pressure setting</td>
<td>12</td>
</tr>
<tr>
<td>[P20] Copy spool</td>
<td>13</td>
</tr>
<tr>
<td>[P24] Tank connection T2</td>
<td>14</td>
</tr>
<tr>
<td>[P25] Tank connection T1</td>
<td>14</td>
</tr>
<tr>
<td>[P26] Pump connection P1</td>
<td>14</td>
</tr>
<tr>
<td>[P28] Separate tank connection for the pilot circuit</td>
<td>14</td>
</tr>
<tr>
<td>End section</td>
<td>15</td>
</tr>
<tr>
<td>[P30-P44] End section</td>
<td>15</td>
</tr>
<tr>
<td>[P31] LS connection</td>
<td>15</td>
</tr>
<tr>
<td>[P32] Pump connection P2</td>
<td>15</td>
</tr>
<tr>
<td>[P34] Tank connection T3</td>
<td>15</td>
</tr>
<tr>
<td>[P40] Tank connection for the pilot circuit</td>
<td>15</td>
</tr>
<tr>
<td>Work section</td>
<td>16</td>
</tr>
<tr>
<td>[P45-P89] Work section</td>
<td>16</td>
</tr>
<tr>
<td>[P47] Connections</td>
<td>16</td>
</tr>
<tr>
<td>[P50] Spool actuators</td>
<td>17</td>
</tr>
<tr>
<td>PC/PCH Hydraulic spool actuator</td>
<td>17</td>
</tr>
<tr>
<td>ECS2/EC2/ECH2 Electrohydraulic spool actuator</td>
<td>18</td>
</tr>
<tr>
<td>ECE</td>
<td>19</td>
</tr>
<tr>
<td>[P51] Lever bracket</td>
<td>19</td>
</tr>
<tr>
<td>[55A, B] Pilot restrictor</td>
<td>20</td>
</tr>
<tr>
<td>[P56] Connector type</td>
<td>20</td>
</tr>
<tr>
<td>[P59] Spool actuator variant</td>
<td>20</td>
</tr>
<tr>
<td>[P60-P74] Spool selection</td>
<td>21</td>
</tr>
<tr>
<td>[P60] Spool function</td>
<td>21</td>
</tr>
<tr>
<td>[P64A, B] Force feedback</td>
<td>22</td>
</tr>
<tr>
<td>[P66] Pressure compensator and load-hold check valve</td>
<td>23</td>
</tr>
<tr>
<td>[P69] Spool designation</td>
<td>24</td>
</tr>
<tr>
<td>[P71A, B] Nominal flow to work port</td>
<td>24</td>
</tr>
<tr>
<td>[P72] Flow settings</td>
<td>24</td>
</tr>
<tr>
<td>[P74] Variant for work section</td>
<td>24</td>
</tr>
<tr>
<td>[P75] Feed reducer valve</td>
<td>25</td>
</tr>
<tr>
<td>[P75A] [P75B] Setting feed reduction in ports A and B</td>
<td>25</td>
</tr>
<tr>
<td>[P76A, B] Pressure relief and anti-cavitation valves</td>
<td>26</td>
</tr>
<tr>
<td>[P85] Side port connection</td>
<td>26</td>
</tr>
<tr>
<td>[P89A, B] Workport variant</td>
<td>26</td>
</tr>
<tr>
<td>[P90-P99] Function block</td>
<td>27</td>
</tr>
<tr>
<td>Accessories</td>
<td>27</td>
</tr>
<tr>
<td>Information</td>
<td>28</td>
</tr>
<tr>
<td>[P50] EC2 manual override</td>
<td>28</td>
</tr>
<tr>
<td>Dimensional drawing</td>
<td>29-30</td>
</tr>
</tbody>
</table>

[P00] refers to an item number in the customer specification
General information

K220LS
Catalogue HY17-8537/UK
Parker Hannifin
Mobile Hydraulic Systems Division Europe
Borås, Sweden

The K220LS is a sectionally-built, load sensing, directional control valve for mobile machinery. The valve is characterised by industry-leading properties regarding robustness, control precision and energy efficiency.

It has a wide range of selectable functions, offering great flexibility in terms of system structure in simple as well as advanced hydraulic system solutions. The K220LS can be equipped with hydraulic or electrohydraulic spool actuators in any combination. Each valve section can be optimised for its particular function in the machinery, with a large range of spools, pressure relief valves, pressure compensators, signal pressure limiters and other performance-enhancing functions.

The K220LS can be constructed in many different designs, with different inlet sections, work sections and end sections. The valve sections are individually specified with threaded or flange ports. The K220LS can also be combined with the smaller L90LS directional valve in order to further optimise functional performance in machinery with large variations in flow requirement.

For complete customer-specific functional adaptation and to accommodate every conceivable need in terms of auxiliary function control, the K220LS can be combined with tailor-made function manifolds consisting of components from Parker’s many product divisions.
### Technical data

**Mobile Directional Control Valve**
**K220LS**

#### Pressure
- **Pump inlet** max 330 bar
- **Workports** max 350 bar
- **Tank, static** max 20 bar

#### Internal pilot pressure
- **Fixed setting** 35 bar or 45 bar

#### Flow capacity
- **Pump connection** 400 l/min
- **Workport with LS compensator** 290 l/min
- **Workport with AS compensator** 220 l/min
- **Workport without compensator** 350 l/min

* = Stated for ΔP 20 bar over the valve

#### Weight

<table>
<thead>
<tr>
<th>Section</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet section, [P15] LS2 + [P10] PT</td>
<td>8.5 kg</td>
</tr>
<tr>
<td>Inlet section, [P15] LS2C, AS2C</td>
<td>11.5 kg</td>
</tr>
<tr>
<td>Work section with PC spool actuator, [P47] PT</td>
<td>8.1 kg</td>
</tr>
<tr>
<td>Work section with PC spool actuator, [P47] FC</td>
<td>13.1 kg</td>
</tr>
<tr>
<td>Work section with EC2 spool actuator, [P47] PT</td>
<td>10.8 kg</td>
</tr>
<tr>
<td>Work section with EC2 spool actuator, [P47] FC</td>
<td>14.5 kg</td>
</tr>
<tr>
<td>Work section with ECE spool actuator, [P47] PT</td>
<td>11 kg</td>
</tr>
<tr>
<td>Work section with ECE spool actuator, [P47] FC</td>
<td>14.7 kg</td>
</tr>
<tr>
<td>End section, [P30] US</td>
<td>4.1 kg</td>
</tr>
</tbody>
</table>

#### Filtration
Filtration must be arranged so that ISO 4406 Target Contamination Class 20/18/14 is not exceeded. For the pilot circuit, ISO 4406 Target Contamination Class 18/16/13 must not be exceeded.

#### Hydraulic fluids
- Best performance is obtained using mineral base oil of high quality and cleanliness in the hydraulic system.
- Hydraulic fluids of type HLP (DIN 51524), oil for automatic gear-boxes Type A and engine oil type API CD can be used.

**Viscosity, working range** 15-380 mm²/s**

#### Temperature
- **Oil temperature, working range** +20 °C to 90 °C**

** Product operating limits are broadly within the above range, but satisfactory operation within the specification may not be accomplished. Leakage and response time will be affected when used at temperature extremes and it is up to the user to determine acceptability at these levels. Performance efficiency will be reduced if the product is used outside the ideal values. These extreme conditions must be evaluated by the user to establish suitability of the product.
[P03] Pump regulator setting
The pressure difference in bar at the valve between the pump and the load signal (PX-PL). The value entered here applies with maximum flow from the valve. The pump must not be overdemanded.

When inlet section [P15] CFC, the pressure drop at idle P1-T1 for the shunt is specified at 20 l/min in [P03]. Selectable between 15-25 bar.

Connections
The K220LS has two different connection methods.
- Threaded ports.
- Flange connections.

The type of connection is determined as follows:
Inlet, [P04] and [P10]
Work section, [P04] and [P47]
End section, [P04]
Depending on the configuration, certain connections shown in the figures below may be absent.

[P04] Connection thread
MG  G-version (BSP pipe thread) for ISO 228/1 flat seal.
Depending on the option in [P10] and [P47], certain ports can also have a flange connection, in which case they use metric threads for screws. Flange connection of standard pressure type according to ISO 6162-1, high pressure according to ISO 6162-2.

MU  UNF-version for O-ring seal according to ISO 11926-1. Depending on the option in [P10] and [P47], certain ports can also have a flange connection, in which case they use metric threads for screws. Flange connection of standard pressure type according to ISO 6162-1, high pressure according to ISO 6162-2.
UU  UNF-version for O-ring seal according to ISO 11926-1. Depending on the option in [P10] and [P47], certain ports can also have a flange connection, in which case they use UNC threads for screws. Flange connection of standard pressure type according to ISO 6162-1, high pressure according to ISO 6162-2.

Screw thread and thread depth for flange connections:
1) MG/MU [P04]: Screw M12
   UU [P04]: Screw 7/16-14 UNC
   Thread depth in section ≥ 25 mm
2) MG/MU [P04]: Screw M10
   UU [P04]: Screw 3/8-16 UNC
   Thread depth in section ≥ 20 mm
3) MG/MU [P04]: Screw M10
   UU [P04]: Screw 7/16-14 UNC
   Thread depth in section ≥ 25 mm

Connection [P04] MG [P04] MU/UU
P1 G 1 1 5/16-12 UN-2B
LS, PL, PX, PS, PLX G 1/4 9/16-18 UNF-2B
YS G 1/4 9/16-18 JIC (37° external thread)

Inlet [P10] PT
Connection [P04] MG [P04] MU/UU
P1, T1, T2 G 1 1 5/16-12 UN-2B
LS, PL, PX, PS, PLX G 1/4 9/16-18 UNF-2B
YS G 1/4 9/16-18 JIC (37° external thread)

Connection [P04] MG [P04] MU/UU
P1 Flange connection SAE 1 high pressure 1)
T1 Flange connection SAE 1 1/4 standard pressure 3)
T2 G 1 1 5/16-12 UN-2B
LS, PL, PX, PS, PLX G 1/4 9/16-18 UNF-2B
YS G 1/4 9/16-18 JIC (37° external thread)
TP G 3/8 3/4-16 UNF-2B

Inlet [P10] PT
Connection [P04] MG [P04] MU/UU
P1, T1, T2 G 1 1 5/16-12 UN-2B
LS, PL, PX, PS, PLX G 1/4 9/16-18 UNF-2B
YS G 1/4 9/16-18 JIC (37° external thread)
Mounting bracket

Standard mounting brackets.

A054 Mounting bracket thinner than standard. This mounting bracket has a larger outlet for P2 connection in the end section allowing more space for the connection nipple. Mounting bracket for inlet according to A304.

A304 Mounting bracket thinner than standard. This mounting bracket is standard in the K170LS.
Hydraulic schematic for valve with [P15] LS2 inlet section and [P66] LS compensators:

Alternative options:
[P10-P29] Inlet section

There are two types of inlet sections depending on the choice of compensator [P66] in the work sections. If the work sections have only LS compensators [P15], LS2 or LS2C inlet is used with a variable pump, or CFC with a fixed pump. If any work section has an AS compensator, the [P15] AS, AS2 or ASC inlet is used.

[P10] Connections

FC    P1 and T1 have flange connections. Other connections are threaded.
PT    All connections are threaded.

[P10B] Section type

B86    Section width, 86 mm.
S67    Section width, 67 mm.
[P12] Internal pilot pressure supply

I Not prepared for pilot pressure supply.

R Internal reducing valve for pilot pressure supply of the spool actuators. Includes a pressure relief valve to protect the pilot circuit, and a check valve to prevent pilot oil from leaking back to the pump. There is a PS port for external use of the reduced pilot pressure.

RX Not prepared for pilot pressure supply. There is a PS port for external supply of pilot pressure.

[P13] Pilot pressure
The pilot pressure can be set at either 35 or 45 bar.

[P14] Pilot filter

S Strainer with bypass function in the internal pilot pressure supply.

YS Blocks the connection between the internal pilot pressure supply and the spool actuators. The reduced pilot pressure can be tapped in the YS connection. Normally used as the outlet for the internal pilot pressure supply to an external filter. The return oil from the filter is connected to PS port to supply the spool actuators.

[P15] Inlet section types

LS2 Inlet section used if all work sections have a [P66] LS compensator. For systems with variable pump. Can be used in the first and subsequent valves in the system.

LS2C Inlet section combining directional valve L90LS with K220LS. Used if all work sections have a [P66] LS compensator. For systems with variable pump. Can be used in the first and subsequent valves in the system.

AS Inlet section used if any of the work sections have a [P66] AS compensator. For systems with variable pump. Can only be used in the first valve in a system.

AS2 Inlet section used if any of the work sections have a [P66] AS compensator. For systems with variable pump. Can only be used in the subsequent valves in a system. AS2 does not have [P18] PLS.

ASC Inlet section combining directional valve L90LS with K220LS. Used if any of the work sections have a [P66] AS compensator. For systems with variable pump. Can only be used in the first valve in a system.

CFC Inlet section used if all work sections have a [P66] LS compensator. For systems with fixed pump. Can be used only in the first valve in the system.
[P15] Applies to inlet section LS2 and LS2C

[P16] Pressure relief valve

[P17] Pressure setting

Y1  [P16] Blocks the connection between the pump and the tank.

PA1  [P16] Direct acting pressure relief valve with a very fast opening sequence and good pressure characteristics. Acts as a pressure relief valve in the pump gallery. When the pressure relief valve opens, a connection is established between the pump and the tank. Available with the following pressure settings (bar) in [P17]: 50, 63, 80, 100, 125, 140, 160, 175, 190, 210, 230, 240, 250, 260, 280, 300, 330, 350, 380.

[P15] Applies to inlet section AS, AS2, ASC and CFC

[P16] Pressure relief valve

[P17] Pressure setting

[PLM] PLM  [P16] With inlet section [P15] AS, AS2, ASC: Adjustable signal pressure relief valve which limits the load signal to the pump. The pump regulator setting stated in [P03] is added to the load signal to calculate the maximum pressure in the pump gallery. The setting for PLM can be chosen between 176-350 bar in [P17]. To ensure that [P66] AS compensators work correctly, the main pressure level must always be limited using the PLM function.

[P16] With inlet section [P15] CFC: Adjustable signal pressure relief valve which limits the pump pressure by the shunt spool opening the P1-T1 connection at the value set in [P17].

[PLS] PLS  [P18] Pilot controlled adjustable pressure relief valve. Acts as a pressure relief valve in the pump gallery. When PLS opens, a connection is established between the pump and the tank. Pilot control for PLS is taken from the load signal. The setting for PLS can be chosen between 20-38 bar. [P15] AS2 and CFC does not have [P18] PLS.
**[P20] Copy spool**

The load signal system consists of a number of shuttle valves, which compare the load signals from different work sections and any signal received from a subsequent valve connected to the LSP port (P31). The highest load signal is sent to the pump via the connection PL in the inlet section, or to a copy spool if the section has one. The copied load signal can then be tapped from the LS port.

/ Housing not prepared for copy spool.

**KS**

Inlet section with copy spool. The valve load signal controls a copy spool which sends a copied load signal to the connection LS. The system permits consumption in the load signal line to the pump without the signal level being affected, because the copied load signal in LS is supplied with oil from the pump gallery instead of oil taken from the workport. In addition to this, the system prevents disruptive micro-sinking of the load in the beginning of the lifting phase.

**LS** = Copied load signal
- the oil is taken from the pump.

**PL** = Uncopied load signal
- the oil is taken from the workport.
[P24] Tank connection T2
Can either be used as a tank connection or fitted with a counter pressure valve. The counter pressure valve increases the pressure in the valve's tank gallery. By raising the counter pressure level the anti-cavitation characteristics of the K220LS are improved still further. Good make-up characteristics eliminate the risk of cavitation and reduce the risk of damage to the cylinder seals. Good make-up characteristic are also important for functions in which a lowering movement changes to a lifting movement without a time delay. For example, when an implement is lowered and then pressed down into the ground, or when a machine turns on sloping ground.

T2    Tank connection T2 open.
T2B   Tank connection T2 plugged.
MF5   Counter pressure valve preset to give 5 bar counter pressure at a flow of 20 l/min.
MF9   Counter pressure valve preset to give 9 bar counter pressure at a flow of 20 l/min.
A055  Counter pressure valve preset to give 5 bar counter pressure at a flow of 20 l/min. Also has built-in leakage for the counter pressure when no work section is activated.
MP    Pilot operated counter pressure valve for external control of counter pressure from 0 to 36 bar. Only provides a counter pressure on receipt of a signal. The maximum permitted signal is 30 bar. The relationship between counter pressure and signal is 1.2:1. Connection thread G1/4 or 9/16-18 UNF-2B.
MP5   As counter pressure valve type MP with the addition of a spring providing 5 bar counter pressure at a flow of 20 l/min. Connection thread G1/4 or 9/16-18 UNF-2B.

T1    Tank connection T1 is open.
T1B   Tank connection T1 is plugged.

[P25] Tank connection T1

[P26] Pump connection P1
P1    Pump connection P1 is open.
P1B   Pump connection P1 is plugged.

[P28] Separate tank connection for the pilot circuit
Note: Only possible with inlet section [P15] LS2C or ASC.

/    Not prepared for separate pilot return.
TP   Separate tank connection for the pilot circuit is open. The connection to the main tank gallery of the directional valve is blocked. For more details see [P40] in the end section.
TPB  The end section is prepared for separate tank connection of the pilot circuit and is plugged. The tank return of the pilot circuit is connected to the main tank gallery of the directional valve.
[P30 - P44] End section

[P30] End section
US Standard end section.

[P31] LS connection
LSP Port for connecting LS signal from following valve open.
LSPB Port for connecting LS signal from following valve plugged.

[P32] Pump connection P2
P2 Pump connection P2 is open.
P2B Pump connection P2 is plugged.

[P34] Tank connection T3
T3, T31 Tank connection T3 is open.
T3B Tank connection T3 is plugged.
T31B

[P40] Tank connection for the pilot circuit
/ Not prepared for separate pilot return.
TP Separate tank connection for the pilot circuit is open. The connection to the main tank gallery of the directional valve is blocked. The function is recommended for systems in which there is a risk of dynamic pressure fluctuations in the tank line, which can cause fluctuations in the pilot circuit when there is a common tank line. TP is recommended for electrohydraulic spool actuators.
TPB The end section is prepared for separate tank connection of the pilot circuit and is plugged. The tank return of the pilot circuit is connected to the main tank gallery of the directional valve.
[P45-P89] Work section

The same valve can contain work sections with different types of spool actuators and compensators. The maximum number of work sections varies according to selected options for the inlet [P15] and its connection [P10]: Inlet section LS2 with threaded ports: Maximum 10 work sections, threaded ports only [P47]. Inlet section LS2, AS and AS2 with flange connection: Maximum 8 work sections. Inlet LS2C and ASC: Maximum 7 work sections.

[P47] Connections

FCS 1” Flange connection standard pressure.
FCH 3/4” Flange connection high pressure.
PT Threaded ports.

[P47B] Section width

B72 Section width, 72 mm. Workports have a flange connection, other ports in caps are threaded.
S50 Section width, 50 mm. All ports are threaded.
[P50] Spool actuators

**PC**  
**Hydraulic spool actuator.**

The PC is a proportional, hydraulically controlled spool actuator with spring centring to the neutral position. It is intended for remote control using a valve of type PCL4 for example. The pilot pressure for the control pressure valve can be tapped from the internal pilot pressure supply. Permitted pressure in the pilot cap max 35 bar.

Control pressure, breakaway 5.6 bar.

Control pressure, final 20.5 bar.

**PCH**  
**PCH Hydraulic spool actuator with hand lever**

As PC, but with the option of proportional control with hand lever.
ECS2 Electrohydraulic spool actuator

The ECS2 is a proportional, hydraulically controlled spool actuator with spring centring to the neutral position. It is intended for remote control using an IQAN, for example. Pilot-pressure oil is passed to the spool actuators through internal ducts in the valve. This means that only the electric cables from the control system to the pilot solenoid valve needs to be connected externally.

Control current for 12 V
Breakaway  min 570 mA
Fully actuated  max 1250 mA
Control current for 24 V
Breakaway  min 290 mA
Fully actuated  max 650 mA

Suitable with PWM signal.

EC2 The EC2 is the same as ECS2, but with manual override. Note: Read the information about manual override for EC2 later in the catalogue.

ECH2 Electrohydraulic spool actuator with hand lever

As ECS2, but with the option of proportional control with hand lever.

ECH2 Electrohydraulic spool actuator with hand lever
**ECE**

The ECE is a spool actuator for On Board Electronics (OBE). The ECE is a proportional, hydraulically controlled spool actuator with spring centring to the neutral position. It has on board electronics and a spool position sensor allowing the flow to be calibrated against a factory command.

System voltage: 24 V.
Controlled with CAN protocol: J1939.
Contacting between sections: Daisy chain.
Connector: Deutsch DT04-4P.
IP class: IP6K6 / IPX9K.

---

**Work section**

**K220LS**

---

**Lever bracket**

LX Supplied without lever bracket
L11 Lever bracket fitted at 75°
L12 Lever bracket fitted at 15°

See picture in [P50] PCH and ECH2.
P55A, B Pilot restrictor

To allow for sensitive remote control, the EC2, ECS2, ECH2, ECE and PCH spool actuators are fitted with pilot restrictors, which can be chosen individually for each workport. The restrictor provides a kind of ramp function.

The following options are available for EC2, ECS2, ECH2 and ECE:

- 0.6 mm pilot restrictor
- 0.7 mm pilot restrictor
- 0.8 mm pilot restrictor
- 0.9 mm pilot restrictor
- 1.0 mm pilot restrictor
- 1.1 mm pilot restrictor
- 1.2 mm pilot restrictor
- 1.3 mm pilot restrictor
- 1.5 mm pilot restrictor
- 2.0 mm pilot restrictor (No damping)

The following options are available for PC and PCH:

- Without pilot restrictor
- 0.6 mm pilot restrictor
- 0.8 mm pilot restrictor
- 0.9 mm pilot restrictor
- 1.0 mm pilot restrictor
- 1.1 mm pilot restrictor
- 1.2 mm pilot restrictor
- 1.3 mm pilot restrictor
- 1.4 mm pilot restrictor
- 1.5 mm pilot restrictor

P56 Connector type

- Spool actuator without connector.
- A AMP Junior-Timer, mates with type C.
- D Deutsch, type DT04-2P, mates with DT06-2S.

P59 Spool actuator variant

**[P60-P74] Spool selection**

The spool is the most important link between the operator’s activation of a lever unit and the movement of the controlled function. For this reason, Parker makes a wide range of standard spools to meet many different function-specific demands. Spools are selected with the aid of a computerised specification program based on a series of different parameters.

**[P60] Spool function**

The spools are available in different basic variants. They are adapted for different flows, load conditions and actuator area ratios. They are also available with different levels of force feedback, see [P64A, B].

- **D** Double-acting spool, e.g. for double-acting cylinders.
- **D1** As spool function D, but designed to be combined with an over-centre valve.
- **D2** As spool function D, but with the option of mechanical force feedback when workport A is activated.
- **DS** As spool function D, but the braced workport to the tank falls at the end of the stroke. Suitable for slewing operations.
- **Dm** Double-acting spool with drainage of A to T and B to T, which prevents pressure build up in the workport in the neutral position. The spool is used as a double-acting spool in combination with an over-centre valve for example.
- **Da** Double-acting spool with drainage of A to T, which prevents pressure build up in workport A in the neutral position. The spool is used as a double-acting spool in combination with an over-centre valve for example.
- **Db** Double-acting spool with drainage of B to T, which prevents pressure build up in workport B in the neutral position. The spool is used as a double-acting spool in combination with an over-centre valve for example.
- **EA** Single-acting spool, e.g. for single-acting cylinders. Lifting and lowering functions at workport A.
- **EA2** As spool function EA, but with the option of mechanical force feedback when workport A is activated.
- **EA3** Single-acting spool, e.g. for single-acting cylinders. Workport B blocked during lifting function. Lowering function at both workports A and B.
- **EB** Single-acting spool, e.g. for single-acting cylinders. Lifting and lowering functions at workport B.
- **E5** Single-acting spool, e.g. for single-acting cylinders. Lifting and lowering function at both workports A and B.
- **M** Double-acting spool, e.g. for hydraulic motor. Floating function in neutral position, connects workport A and B to tank.
- **MA** Double-acting spool, e.g. for hydraulic motor. Floating function in neutral position, workport A to tank.
- **MB** Double-acting spool, e.g. for hydraulic motor. Floating function in neutral position, workport B to tank.
- **CB** Regenerative spool via workport B. The large side of the cylinder is connected to workport B.
[P64A, B] Force feedback

The K220LS is available with a force feedback option in individual work sections. With force feedback, the operator is better able to sense the increase in machine load, for example when a hard obstacle is met, and thereby avoid damage. Force feedback also gives provides a kind of ramp function, which results in more gentle transitions during speed changes. This in turn has a stabilising effect on the hydraulic system, and the machine operating characteristics become smoother. Both these characteristics are important, especially for slewing functions and similar movements. With force feedback, machine wear is reduced and efficiency increases.

The section can be equipped with force feedback for workports A and B, individually. The higher the level of force feedback, the greater the reduction in the function’s speed upon increasing resistance for the same lever stroke. It follows from this that the lever must be moved further in order for the speed to remain the same.

/ No force feedback.
FF Hydraulic force feedback. The level of force feedback depends on the choice of pilot restrictor in [P55A, P55B]. The smaller the pilot restrictor diameter, the higher the level of force feedback.
A024 Hydraulic force feedback, as FF, but with a smaller restrictor in the spool.
FM Mechanical force feedback on the A side for spool function **2 in [P60]. Some spools on the B side can use hydraulic force feedback. Normal level of force feedback.
FM+ As force feedback FM, but with a low level of force feedback.
A032

![Graph showing volume flow and force feedback relationship](image-url)
Pressure compensator and load-hold check valve

The primary purpose of pressure compensation is to maintain a constant flow rate to a function, regardless of pressure variations in the system.

The load-hold check valve prevents oil passing from the workport to the pump gallery if the pump pressure falls below the load pressure.

K220LS compensator types:

K220LS can have two compensator types in the work sections:
LS compensators, which provide a fixed, selectable pressure drop over the main spool. If the pump is overdemanded, the flow from the section with the highest load pressure is reduced.
AS compensators, which provide a fixed, selectable pressure drop over the main spool based on \( \Delta P \) over the valve. If the pump is overdemanded, the flow is reduced for all actuated sections with AS compensators.

If a combination of LS and AS compensators is used, the flow is prioritised for the sections with LS compensators.

LS compensator types:

**K1** Fixed pressure compensator with load-hold check valve.

**EK2** Fixed pressure compensator with load-hold check valve. Provides about 20% more flow than K1.

**EK3** Fixed pressure compensator with load-hold check valve. Provides about 55% more flow than K1.

**KN1** Fixed pressure compensator with load-hold check valve. Provides about 5% more flow than K1.

**A077** Function as KN1. Provides about 25% more flow than K1.

**N1** Only load-hold check valve, provides no pressure compensation.

**X1** Section without compensator or load-hold check valve. Prepared for retrofitting of compensator or load-hold check valve.

AS compensator

**KAS** Compensator for systems with flow distribution. With a pressure difference of 20 bar between PX and LS, the flow to the workports is about 25-40% more than that of a compensator of type K1.
[P69] Spool designation
Spool selection is carried out using the configuration program for K220LS.

[P71A, B] Nominal flow to work port
Specified at ΔP 20 bar across the valve for all compensators other than when N1 and X1 are used, in which case the flow information is at ΔP 15 bar.

[P72] Flow settings
With PC and PCH spool actuators, flow limitation over the spool to workports A and B can be effected by means of mechanical limitation of the spool stroke length. By choosing options in [P59], mechanical stroke limitation can be combined with EC2, ECS2 and ECH2.

/ No flow settings.
Qset Limitation of maximum flow in workports A and B.
Qset A Limitation of maximum flow in workport A.
Qset B Limitation of maximum flow in workport B.

[P72A] Desired set flow
The desired flow for workport A is entered here.

[P72B] Desired set flow
The desired flow for workport B is entered here.

[P74] Variant for work section
/ No variant.
A001 Compensator plug with connection thread G 1/4 or 9/16 UNF-2B allowing tapping of the section load signal controlling the compensator externally. For example, external feed reducer.
A240 Spool with lower internal leakage from the workport than standard spools.

Connection, A001
[P75] Feed reducer valve

The feed reducer valve is a signal pressure limiter on the load signal.

The signal pressure limiter limits the pressure in the workport by causing the compensator spool to close the pump-workport connection when the signal pressure limiter reaches a preset value. This closes the flow and the function consumes a total of no more than 2 l/min, thereby limiting the pressure with minimal flow/heat loss.

The feed reducer valve cannot handle external pressure peaks, so if they occur, it is recommended to use pressure relief valves in [P75A, B].

The set pressure in the feed reducer is adjustable.

The set pressure is specified in the relevant workport [P75A], [P75B]. To disable the feed reducer function, select “MAX” in [P75AM], [P75BM].

MR Work section with feed reducer valve for workports A and B. Pressure settings from 30 to 330 bar.

MRC Work section with common feed reducer valve for workports A and B, same setting in both ports. The MRC is different on the work sections: Threaded sections PT [P47], adjustable to 30-330 bar. Sections with flange connection FCS, FCH [P47], adjustable to 175-330 bar.

MRM Only for a work section with flange connection FC in [P47]. Common feed reduction for workports A and B in the section plus all subsequent sections. Adjustable to 175-330 bar.
[P76A, B] Pressure relief and anti-cavitation valves
The Parker PLC185 is used as a pressure relief valve in the workports of the work sections, protecting from pressure peaks in the PLC185 system and also performing an anti-cavitation function. The PLC185 is a cartridge with fixed pressure setting. The anti-cavitation valve causes oil to flow from the main tank gallery to the workport side in the event of underpressure in the workports.

Anti-cavitation characteristics
The curve shows the pressure drop between tank connection and workport when a pressure relief valve (PA) or anti-cavitation valve (N2) is used.

X2 Workport open to tank.
Y2 The connection from the workport to T is blocked with a plug.
N2 Workport equipped with anti-cavitation valve.
PA Pressure relief valve with anti-cavitation function for workport PLC185. Selectable pressure settings in bar:
50, 63, 80, 100, 125, 140, 160, 175, 190, 210, 230, 240, 250, 260, 270, 280, 300, 310, 320, 330, 350 and 365.

[P85] Side port connection
Internal connection between workports to adjacent sections or to a function block. The diameter of the side port connection is 8.5 mm so it is not a full flow connection. The aim is to equalise the pressure in sections actuated in parallel, or to transfer a signal to a manifold.

/ No internal connection between workports.
M1 Side port connection to previous section (towards the inlet).
M2 Side port connection to previous and next sections.

[P89A, B] Workport variant
A214 Cavity plug instead of solenoid in EC2/ ECS2/ ECH2 in [P50].

The example shows: A214 [P89B]
[P90-P99] Function manifold
The K220LS can be equipped with a function manifold allowing complete system solutions to be integrated into the valve. Please contact Parker for more details on integrated system solutions.

Accessories
Connectors, levers, etc. are available as accessories. They must be ordered separately.

See our accessories catalogue (HY17-8558/UK).
**Manual override may not be used without knowledge of functionality.**

**CAUTION: No proportional function**

1. A special tool must be used to engage the manual override function of the solenoid! Use of other tools to attempt to engage or disengage the manual override may not work or may not work when intended.

2. When using the manual override function, the solenoid has only on-off functionality and doesn’t operate proportionally as usual. This means, for example, that the solenoid may operate much faster than usual and the unexpected speed could cause crushing or other injuries.

3. When using the manual override be certain that all operations of the application, regardless of speed, will not endanger persons or property nearby.

4. As always, consult the operations manual for all specifications and functions of the valve. If there are questions contact MSDE.

The PS25MO is equipped with a manual override pin in the connector. To actuate the PS25MO a specific tool is needed since the tolerances of the pin is so small that it can be damaged or the pin sticks in actuated position.

Please notify that it’s for fault searching only and shall be used as rarely as possible with common sense in mind. If manual override is used humans can be exposed for very dangerous situations. Please read the legal limits before using the manual override.

Part number for override tool: 6763001.
T31 Tank connection

K220LS work section FCx

Dimensional drawing

T31 Tank connection

K220LS work section FCx

Dimensional drawing

Tank connection T31

K220LS work section FCx

Dimensional drawing
K220LS work section PT

K220LS work section PT

123.4 + N x 50.0 = No of work sections
Parker Worldwide

Europe, Middle East, Africa

AE – United Arab Emirates, Dubai
Tel: +971 4 8127100
parker.me@parker.com

AT – Austria, Wiener Neustadt
Tel: +43 (0)2622 23501-0
parker.austria@parker.com

AT – Eastern Europe, Wiener Neustadt
Tel: +43 (0)2622 23501 900
parker.easteurope@parker.com

AZ – Azerbaijan, Baku
Tel: +994 50 22 33 458
parker.azerbaijan@parker.com

BE/LU – Belgium, Nivelles
Tel: +32 (0)67 280 900
parker.belgium@parker.com

BG – Bulgaria, Sofia
Tel: +359 2 980 1344
parker.bulgaria@parker.com

BY – Belarus, Minsk
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

CH – Switzerland, Etoy
Tel: +41 (0)21 821 87 00
parker.switzerland@parker.com

CZ – Czech Republic, Klecany
Tel: +420 284 083 111
parker.czechrepublic@parker.com

DE – Germany, Kaarst
Tel: +49 (0)2131 4016 0
parker.germany@parker.com

DK – Denmark, Ballerup
Tel: +45 43 56 04 00
parker.denmark@parker.com

ES – Spain, Madrid
Tel: +34 902 330 001
parker.spain@parker.com

FI – Finland, Vantaa
Tel: +358 (0)20 753 2500
parker.finland@parker.com

FR – France, Contamine s/Arve
Tel: +33 (0)4 50 25 80 25
parker.france@parker.com

GR – Greece, Athens
Tel: +30 210 933 6450
parker.greece@parker.com

HU – Hungary, Budaoers
Tel: +36 23 885 470
parker.hungary@parker.com

IE – Ireland, Dublin
Tel: +353 (0)1 466 6370
parker.ireland@parker.com

IT – Italy, Corsico (MI)
Tel: +39 02 45 19 21
parker.italy@parker.com

KZ – Kazakhstan, Almaty
Tel: +7 7273 561 000
parker.easteurope@parker.com

NL – The Netherlands, Oldenzaal
Tel: +31 (0)541 585 000
parker.nl@parker.com

NO – Norway, Ask"er
Tel: +47 66 75 34 00
parker.norway@parker.com

PL – Poland, Warsaw
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

PT – Portugal, Leca da Palmeira
Tel: +351 22 999 7360
parker.portugal@parker.com

RO – Romania, Bucharest
Tel: +40 21 251 1382
parker.romania@parker.com

RU – Russia, Moscow
Tel: +7 495 645 2156
parker.russia@parker.com

SE – Sweden, Spånga
Tel: +46 (0)8 39 79 50 00
parker.sweden@parker.com

SK – Slovakia, Banska Bystrica
Tel: +421 484 162 252
parker.slovakia@parker.com

TR – Turkey, Istanbul
Tel: +90 216 4997081
parker.turkey@parker.com

UK – United Kingdom, Warwick
Tel: +44 (0)1926 317 878
parker.uk@parker.com

ZA – South Africa, Kempton Park
Tel: +27 (0)11 961 0700
parker.southafrica@parker.com

North America

CA – Canada, Milton, Ontario
Tel: +1 905 693 3000

US – USA, Cleveland (industrial)
Tel: +1 216 896 3000

US – USA, Elk Grove Village (mobile)
Tel: +1 847 258 6200

Asia Pacific

AU – Australia, Castle Hill
Tel: +61 (0)2-9634 7777

CN – China, Shanghai
Tel: +86 21 2899 5000

HK – Hong Kong
Tel: +852 2428 8008

ID – Indonesia, Tangerang
Tel: +62 21 7588 1906

IN – India, Mumbai
Tel: +91 22 6513 7081-85

JP – Japan, Fujisawa
Tel: +81 (0)4 6635 3050

KR – South Korea, Seoul
Tel: +82 2 559 0400

MY – Malaysia, Shah Alam
Tel: +60 3 7 849 0800

NZ – New Zealand, Mt Wellington
Tel: +64 9 574 1744

SG – Singapore
Tel: +65 6887 6300

TH – Thailand, Bangkok
Tel: +662 186 7000

TW – Taiwan, New Taipei City
Tel: +886 2 2298 8987

VN – Vietnam, Ho Chi Minh City
Tel: +84 8 3999 1600

South America

AR – Argentina, Buenos Aires
Tel: +54 3327 44 4129

BR – Brazil, Cachoeirinha RS
Tel: +55 51 3470 9144

CL – Chile, Santiago
Tel: +56 2 623 1216

MX – Mexico, Toluca
Tel: +52 72 2275 4200

Your local authorized Parker distributor

Parker Hannifin Limited
Tachbrook Park Drive
Tachbrook Park,
Warwick, CV34 6TU
United Kingdom
Tel.: +44 (0) 1926 317 878
Fax: +44 (0) 1926 317 855
parker.uk@parker.com
www.parker.com

European Product Information Centre
Free phone: 00 800 27 27 5374
(from AT, BE, CH, CZ, DE, DK, EE, ES, FI, FR, IE, IL, IS, IT, LU, MT, NL, NO, PL, PT, RU, SE, SK, UK, ZA)