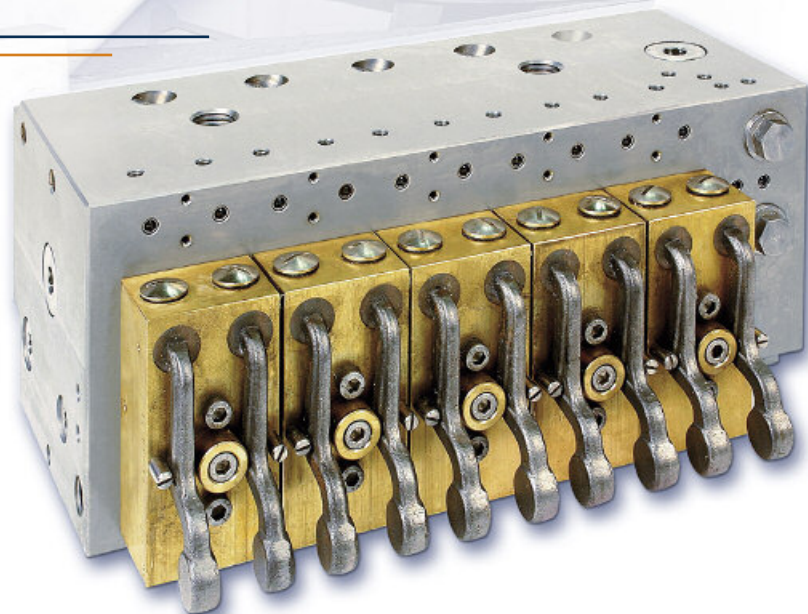


**TIEFENBACH**  
Control Systems GmbH



We give  
impulses >>>

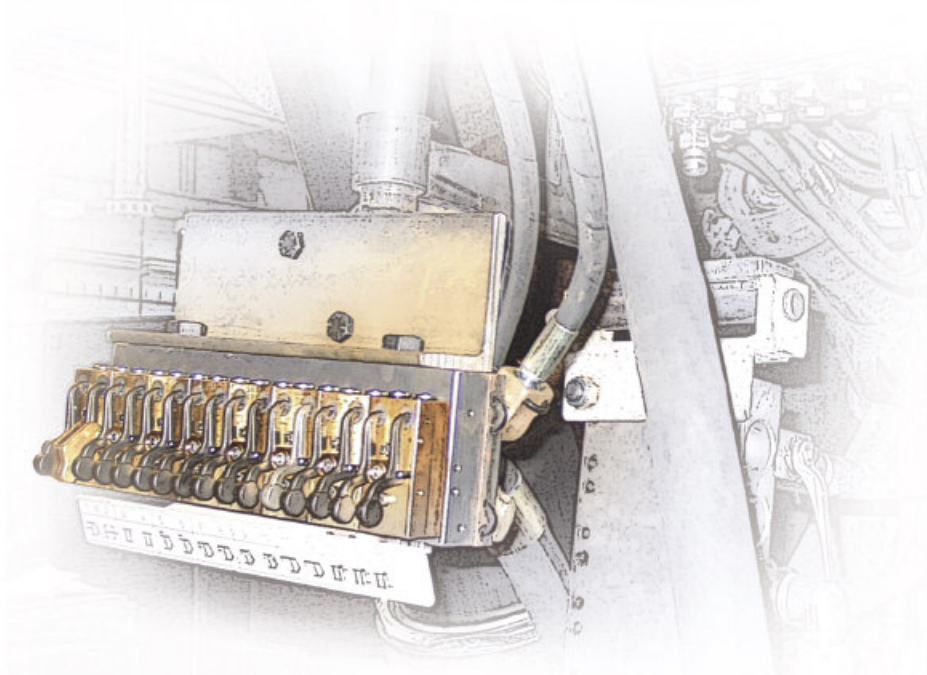


## **HYDRAULIC CONTROL SYSTEMS**

FOR THE CONTROL OF THE HYDRAULIC CYLINDERS  
AND PROPS IN SHIELD SUPPORT UNITS UNDERGROUND

# HYDRAULIC CONTROL SYSTEMS

BY TIEFENBACH CONTROL SYSTEMS...

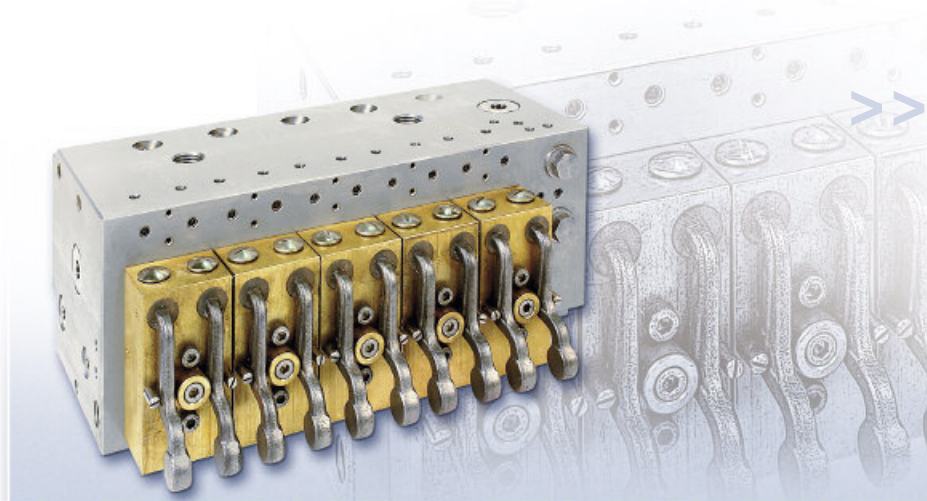


## APPLICATION

- The hydraulic control system is suitable for all applications where hydraulic cylinders have to be moved in a harsh environment
- The hydraulic control systems are optimized for the control of ...
  - tensioning frames
  - plow shields
  - shearer shields
  - sublevel caving operations

## FUNCTION AND DESIGN

- The electro-hydraulic control units used worldwide are of rugged design and have been especially developed for underground mining operations. However, they can also be used in almost every other area such as e.g. in rolling mills or as motor control units.
- In order to be able to fulfil the most varied requirements of powered roof supports and meet the demands specified by the individual customers in the best possible way the hydraulic control units can be combined choosing from a wide variety of individual components. In addition to the number of functions and the manifold port sizes for the hose lines valve capsules with different flow rates are available. The pilot control valves flanged to the control block which are used for operating the 3/2-way valve capsules are also available in different variants to suit the specifications of the different.
- For certain functions of the shield support, as for example for controlling the flipper cylinder, valve capsules can be designed as blocking valves. The respective valve capsules have a check valve integrated between the working port and the return which prevents that the flipper cylinder can retract all by itself.
- The valve inserts are designed in cartridge form for easy replacement of the wear parts and can, same as the 40 µm filter integrated in the control, be exchanged quickly.
- In addition to the variants of the standard version a large number of further designs is possible by using control block housings with different hole patterns. Thus, for example, the control of four valve inserts can be effected via a pilot control valve. A further variant would be to supply selected valve inserts with a different system pressure via an additional pressure port.



## DIRECT TYPE

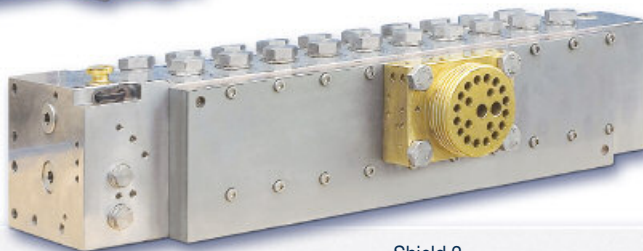
The Direct Type has the pilot valves fitted to the control block direct. This type of control is preferably used on shields which are easily accessible.





PILOT CONTROL UNIT

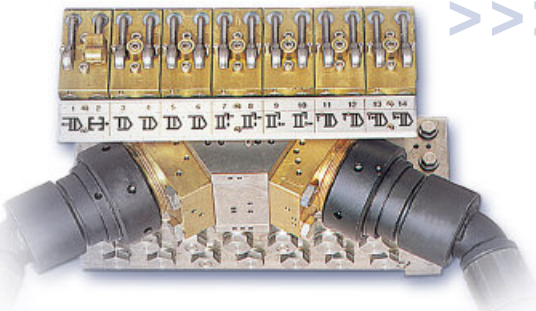
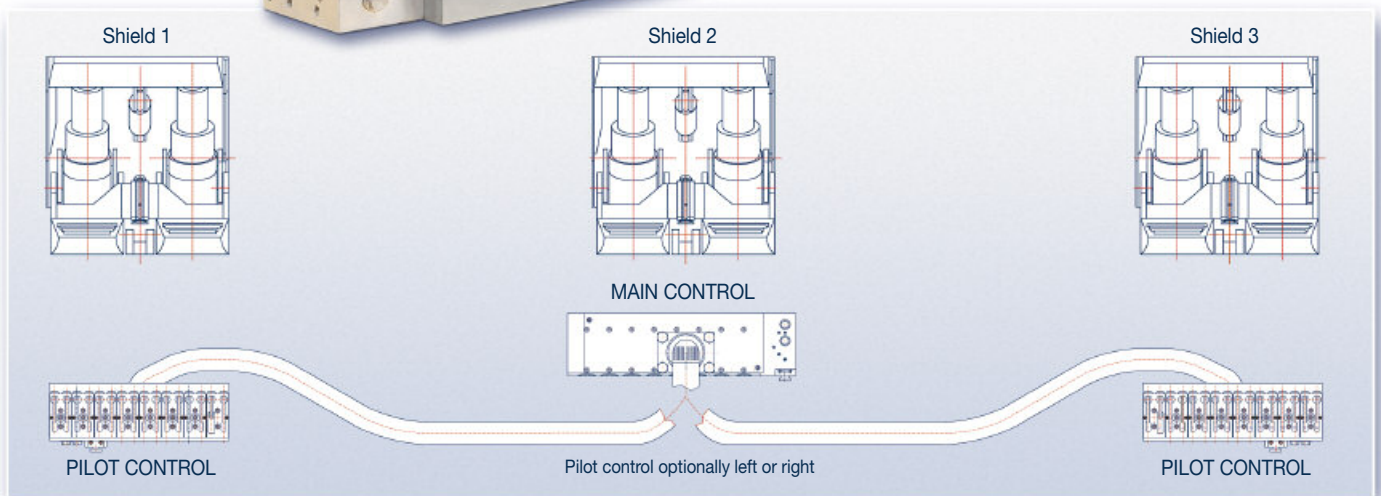
MAIN CONTROL UNIT



## >>> SPLIT TYPE

While in the Direct Type the pilot valves are flanged to the main valve block direct the split type has the pilot control unit separated from the main valve block.

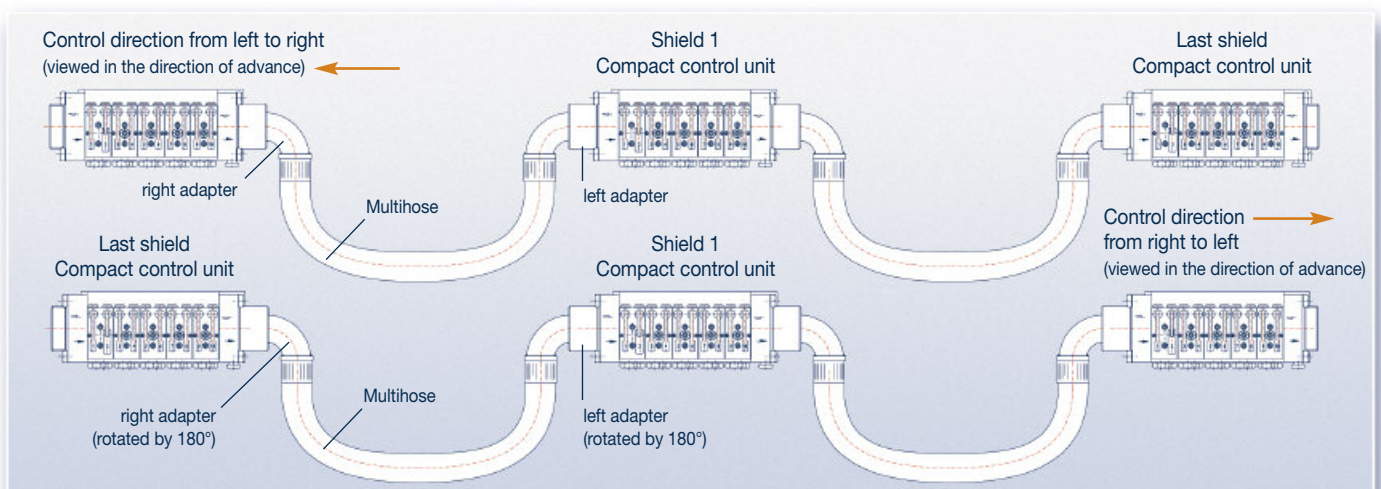
The pilot control via the „Multi hose“ permits a flexible and uncomplicated operation particularly on high shields.



## >>> COMPACT TYPE

Compact control unit with a pyramid-shaped and straight connection block for multihoses

The compact control system has the connection block for the „multi-hoses“ fitted between the pilot control unit and the main control block. This connection block interconnects the individual compact control units in the shields. This arrangement eliminates the need for the complicated shield-to-shield hose routing. The compact controls particularly lend themselves for use on low shields.

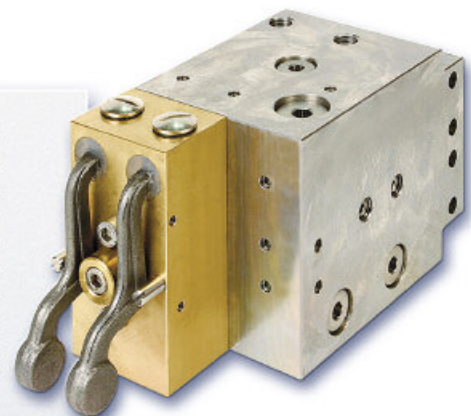
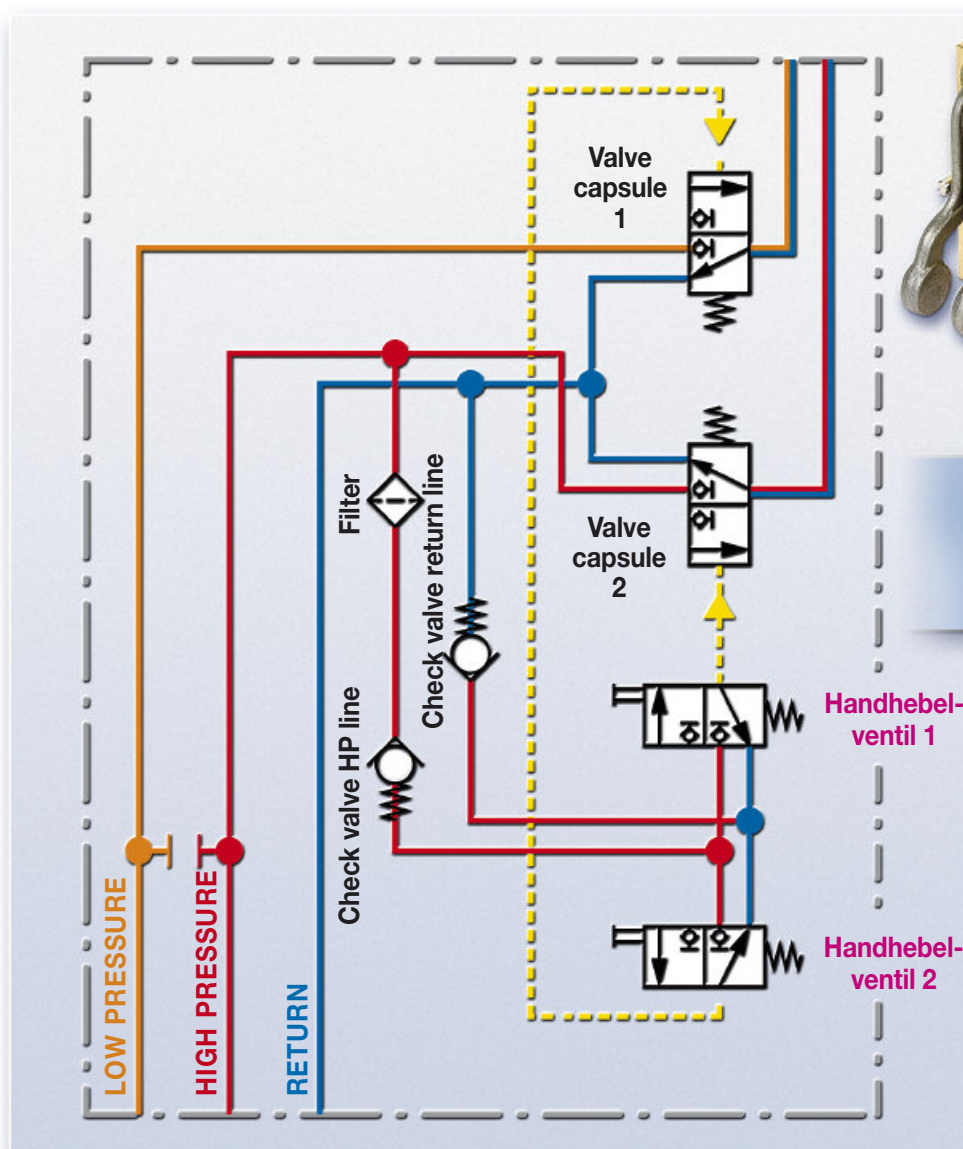


# HYDRAULIC CONTROL SYSTEMS

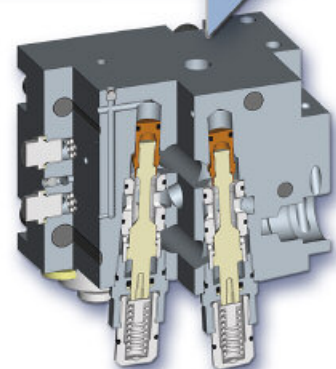
BY TIEFENBACH CONTROL SYSTEMS...



## >>> HYDRAULIC DIAGRAM FOR HYDRAULIC CONTROL SYSTEM 2-FUNCTIONS



Expandable  
to **24**  
functions





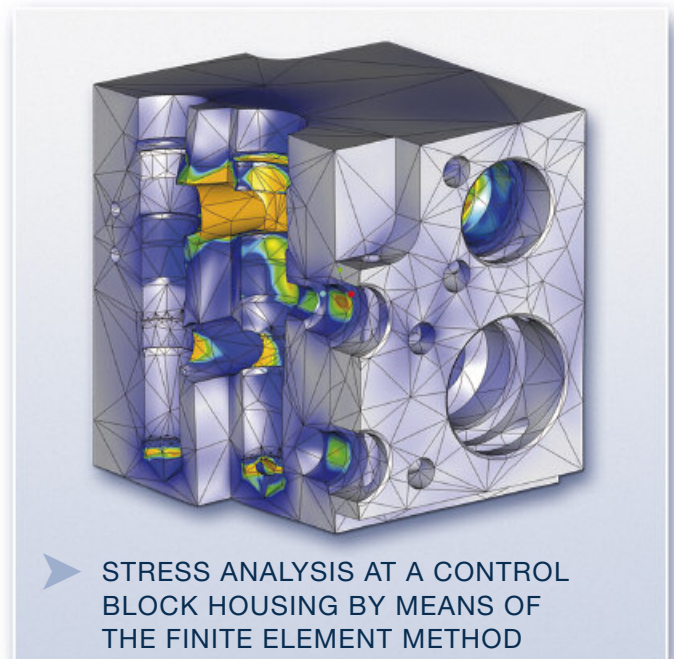
## >>> THE CONTROL BLOCK HOUSING

is made of stainless steel and, based on our many years of experience, has been adapted by us to suit the harsh conditions underground. The control block in its standard version is designed for a pressure of 350 bar.

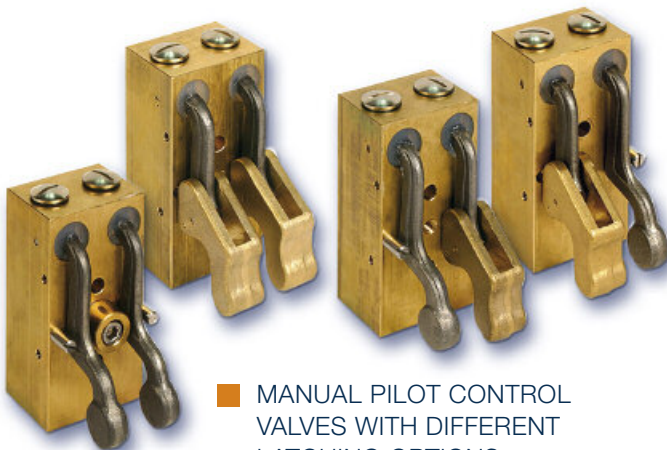
In order to ensure optimum safety against high-pressure hazards each control block housing is checked for weak points by the Finite Element Method (FEM) as early as in the design process and optimized accordingly.

The control block housing interiors vary in their design to meet the individual hydraulic control requirements of the roof support. For example, the housings are equipped with additional high-pressure or low-pressure ports or provided with a directional control valve control deviating from the standard.

The steck-o-ports are also designed to fulfil individual customer requests so that the support can be controlled with optimum volume flows.



➤ **STRESS ANALYSIS AT A CONTROL BLOCK HOUSING BY MEANS OF THE FINITE ELEMENT METHOD**



■ **MANUAL PILOT CONTROL VALVES WITH DIFFERENT LATCHING OPTIONS**

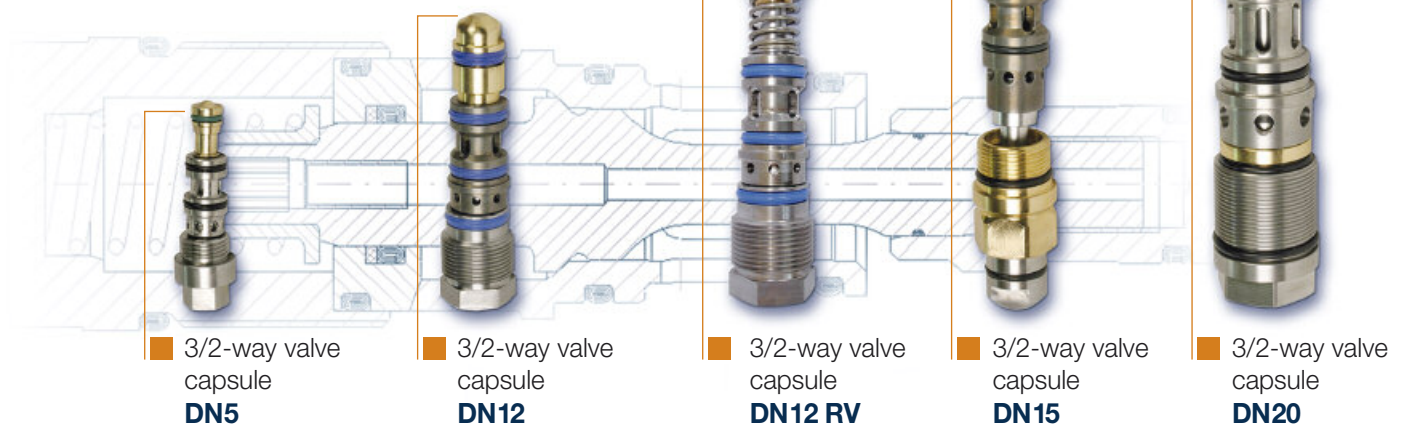
## >>> THE PILOT CONTROL VALVES

control the 3/2-way valve capsules hydraulically. Each pilot valve is responsible for the activation of two directional control valve capsules. Both the pilot valves and the 3/2-way valve capsules are operated with the same medium.

Depending on the requirements to be met by the control process several different types of pilot valves may be necessary. For an optimized functionality non-locked, L.H. lever locked, R.H. lever locked and double locked type control valves are used. The manually operated lock remains active until it is deactivated manually.

## >>> THE 3/2-WAY VALVE CAPSULES

come in different nominal sizes permitting to optimize them for each specific application. Thanks to the intelligent cartridge construction the replacement of the valve inserts is very easy.



■ **3/2-way valve capsule DN5**

■ **3/2-way valve capsule DN12**

■ **3/2-way valve capsule DN12 RV**

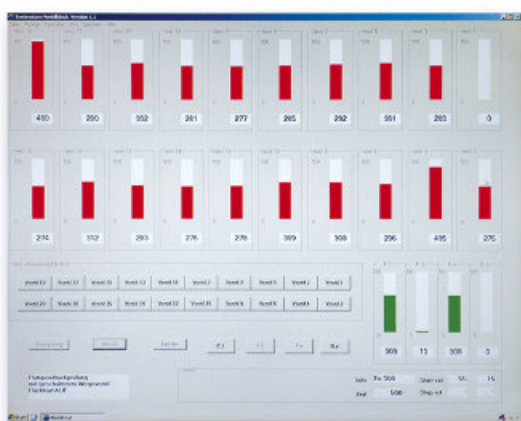
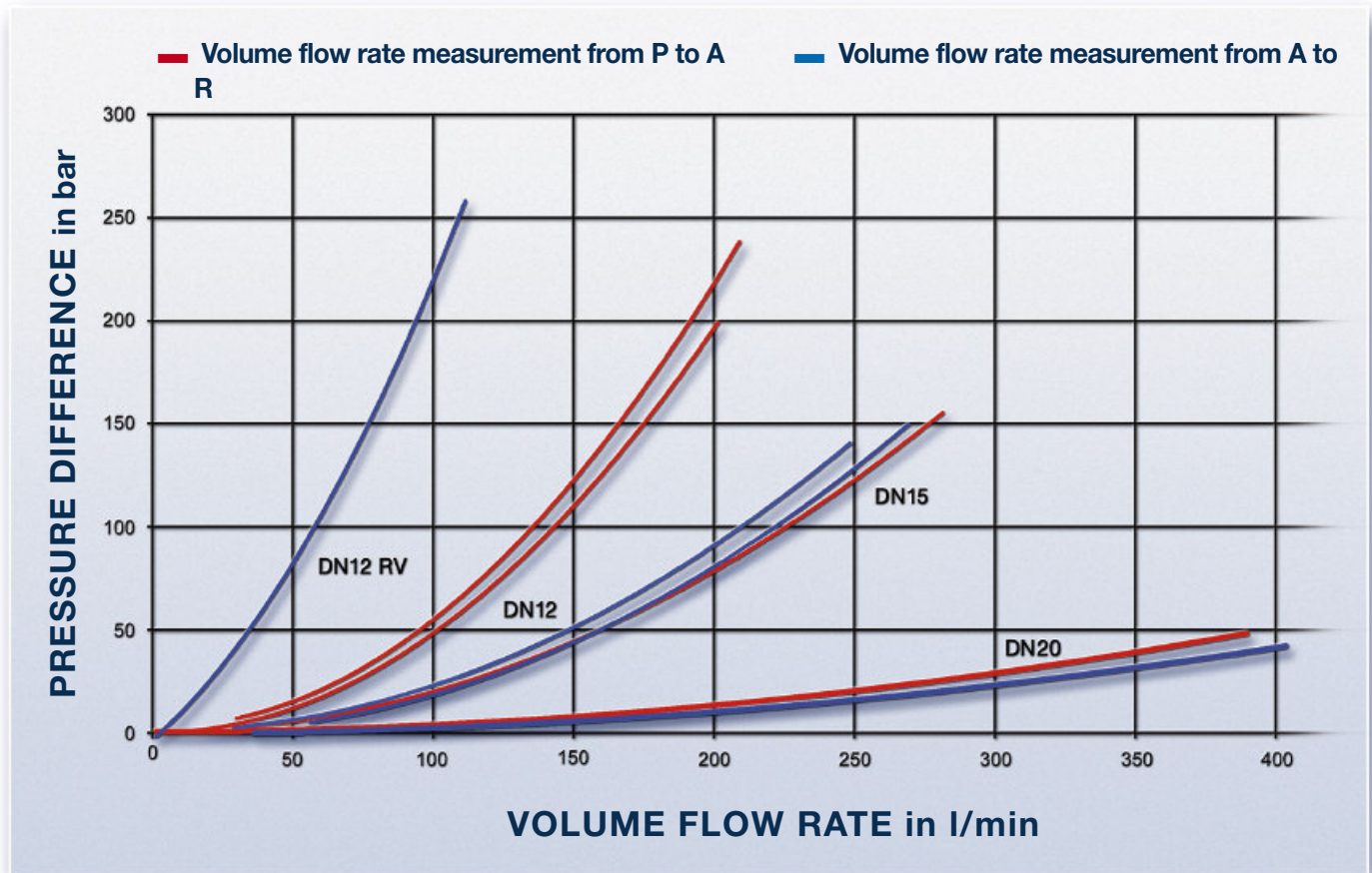
■ **3/2-way valve capsule DN15**

■ **3/2-way valve capsule DN20**

# HYDRAULIC CONTROL SYSTEMS

BY TIEFENBACH CONTROL SYSTEMS...

## >>> VOLUME FLOW RATE MEASUREMENTS



>>> All control units leaving our factory are tested 100% and the results are recorded. This is what we owe to our customers



>>> To be on the safe side, all functions of the control unit are tested several times automatically using special company-own software



More than **60 YEARS**  
**OF EXPERIENCE**  
in water hydraulics



>>> We have plenty more control systems with special and additional functions in our program.  
**We look forward to receiving your inquiry.**

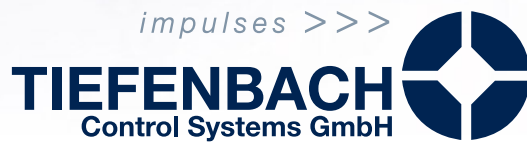
## TECHNICAL DATA

➤ Type of pilot control valve:	Ball seat valve nominal size DN2
➤ Type of main control valve:	Plug-type connection acc. to DIN 20043 in nominal sizes DN12, DN15 or DN20
➤ Ports:	Plug-type connection acc. to DIN 20043 in nominal sizes DN10 / DN12 / DN16 / DN19 / DN25 / DN31
➤ Fitting position:	any
➤ Pressure range:	350 bar to 420 bar
➤ Flow rate:	from 150 l/min to 800 l/min (depending on the variant chosen)
➤ Temperature range:	+5°C to +45°C
➤ Pressure medium:	HFA
➤ Viscosity range:	0 to 36 cSt
➤ Pilot control valve filters:	Mesh size 40 µm
➤ Operation:	mechanically by hand

- The information given in this leaflet is for guidance only.
- Obligations and commitments or claims of any kind cannot be derived therefrom.

Version 05/12

*We give  
impulses >>>*



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