Carbon Dioxide

CO2 System

Fire Suppression Gas System

FIRE SUPPRESSION CO2 GAS SYSTEMS.

Catalogue

Arka Sanat
Pishro
Sepehr

RK-CAT-04-01

Trust
RK Arka Sanat
Firefighting & Fire Alarm Systems

www.arkasanat.com info@arkasanat.com

CONTENT

Welcome to Arka Sanat Pishro

Our dreams is build a new generation of high quality design and development with professional skills and efficiency technology in firefighting and fire alarm systems.

Arka Sanat Pishro (RK) is specialized in designing, manufacturing and installation Firefighting and Fire Alarm systems. When it comes to fire safety and extinguishing solutions, reliability is essential. Therefore, Arka Sanat (RK) exclusively cooperates with internationally acknowledged partners.

Arka Sanat with his brand that name is “Trust” and RK has multiple experiences of consulting and performing in national industries of Oil and Gas, Petrochemical, Refinery, Mining, Municipality, Airport, Fire department, Administrative and Commercial centers.

However Arka Sanat offers a lot more than products and services. By all means, we are involved during the complete project and the final commissioning to finish every project successfully.

We Offer Creative Design

www.arkasanat.com

WHY CHOOSE US?

is Creative Design

Our strong sense of identification with client projects means that we are constantly striving to provide solutions, even for issues they aren't yet aware of. To this end, we adopt a progressive approach to technology and marketing techniques.

This sense of identification also means we value and promote seamless interaction with clients' own teams, and ensure the best value is obtained from their event budget, We love what we do, some might say a bit too much & we bring enthusiasm and commitment to every project we work on.

- Focus on quality
- Great company value
- 20 years of experiences
- Professional
- Quick response
- Passionate team

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Our Best Services

Today, The Arka Sanat provides Fire Safety Systems with integrated solutions for any fire protection challenge, The Arka Sanat profession focuses on Designing and Construction a wide variety of safety equipment to human health and safety in the workplace. Rely on Arka Sanat to deliver:

Design & Engineering

Arka Sanat engineering services leverage the cross-functional group of experts at Arka Sanat to deliver creative, accurate solutions to complicated challenges in a shorter period of time.

Procurement & Logistics

Making the details come together is critical to a projects success. Our team works with suppliers to negotiate competitive pricing, delivery expectations, logistics, and administrative details. They also work closely with project management to assure all items are at the site when needed in good condition.

Construction & Production

Arka Sanat provides predictable and reliable service for firefighting and Fire Alarm Systems. we offer accountability for results. Safety was the driving force behind the decision to start our company, and it remains a crucial factor on every construction project.

About Our Product

We are a professional & solid company team who works with passion & skills to provide the best design for business needed.

Arka Sanat Company will provide all parts of CO_2 System Package with the highest quality, as follows:

- Cylinder and Accessories
- Valve and Accessories
- Weighting Device
- Manifold
- Support
- Nozzle
- Panel and Alarm System

These are manufactured in corrosion resistant material, bronze and brass and are suitable for both onshore and offshore applications.

We can imagine that you still have some question about you own specific situation after reading this leaflet. Our colleagues will be pleased to help you by making a good chance for your kind of risk.
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UL LISTED FM APPROVED NFPA

CO2 Extinguishing System identified in the NFPA-12 (Standard on Carbon Dioxide Extinguishing System) CO2 System is considered to protect normally unoccupied areas.

As a general rule, fire protection system begins with a risk assessment, This process will clarify whether an active fire protection system is required, how fast it must respond and whether a gas extinguishing is suitable and practical.

In the design of a Gas Fire Suppression system, it is important to define correctly the hazard and conduct a thorough survey to determine if the Inert Gas System will properly protect the Enclosure/ hazard.

The Gas Fire Suppression system is effective to suppress the following types of fire:

Class D - Combustible Metals:

Reactive metals such as lithium, sodium, potassium, magnesium, titanium, zirconium, uranium & plutonium.

Certain chemicals or mixture of chemical such as cellulose nitrate and gunpowder, that is capable of raid oxidation in the absence of air.

Chemicals capable to auto thermal decomposition, such as certain organic peroxides and hydrazine.

And metal hydrides.

The Inert gas suppression system suppresses fire by reducing the Oxygen level within the hazard enclosure to the level which cannot support combustion, typically below 15% Oxygen level. It is employed as a total flooding system and should not be used for local application system.

In the design of a Gas Fire Suppression system, it is important to correctly define the hazard and conduct a thorough survey to determine if the Inert gas system will properly protect the enclosure/ hazard. The Inert gas system should be used with an automatic early fire detection system to prevent a deep seated fire to develop as a result of a long pre-burn time.

Fire Suppression CO_2 Gas System Design & Engineering

System Type System Area Classification	Automatic CO2
Area Classification	Class C-electrical fire
Fire Type	Total Flooding
Base of Design	Deep-seated
Code & Standard	NFPA 12
Flooding Factor	1.33
Safety Factor	1.1
Discharge Time	7 min
Concentration of CO2	30% in 2 minutes and 50% in 7 minutes
Capacity of Cylinders	67 Lit - 45kg

The isometric drawing shall be included as part of the calculation package and should show the following:

a) Pipe diameters and length

b) Nozzle flow rates (m^3/min)

c) Contract reference number

d) System title / name

e) Node numbers

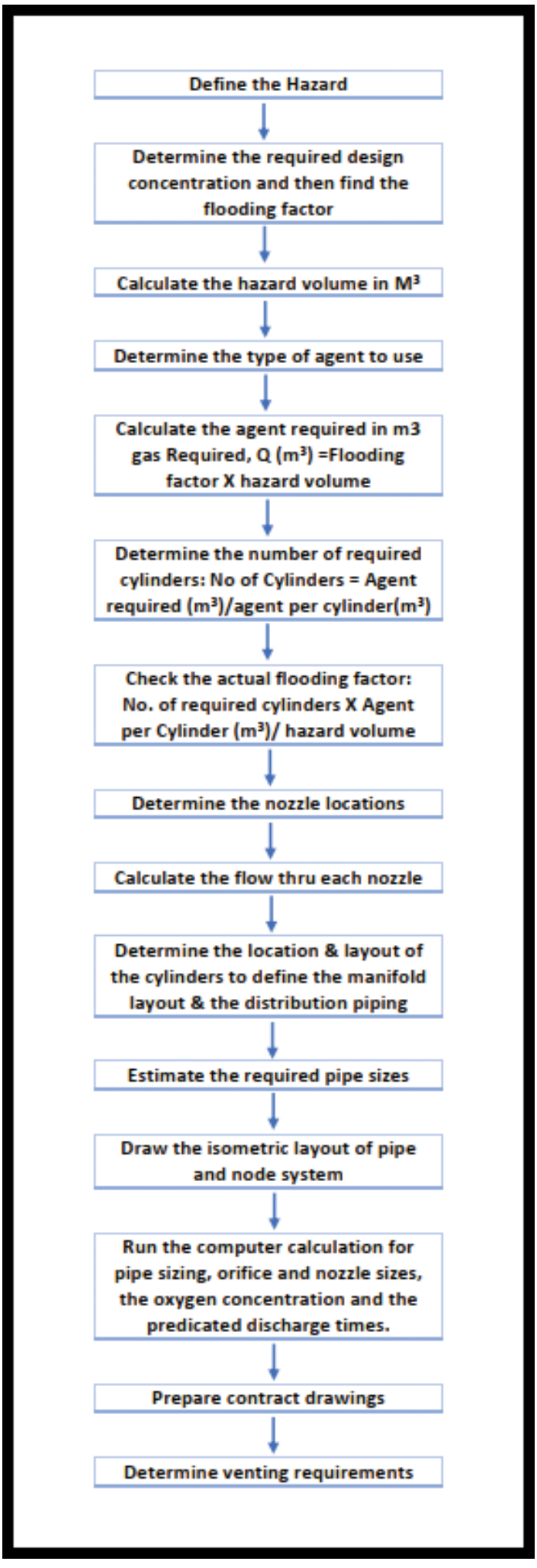
f) Number of revisions) if any

g) Name of Design Engineer

General arrangement drawings to be drawn according to scale, dimensional plans and evaluations of the hazard showing:

a) Main structural feature
b) Pipe routing
c) Bracket position and details
d) Pipe specifications
e) Cylinder(s) location
f) Manifold position (s)
g) Nozzle(s) location
h) Detector(s) location
i) Audio & visual Alarm equipment location
j) Bill of material (s)

Arka sanat's Design Flow-Chart



Carbon Dioxide (CO2) is widely used in the fire industry as an extinguishing agent for total flooding and local application fire suppression systems.

Physically the CO2 is an electrically non-conductive, odourless and colourless gas, it is heavier than air and does not leave residuals upon discharge, these properties make it a perfect choice for the fire protection of highly valuable equipment.

Carbon Dioxide is then preferred to protect hazards in normally unoccupied areas, where the presence of personnel in the protected spaces is regulated by safety devices and procedures.

The Arka Sanat's high pressure Carbon Dioxide extinguishing systems provide protection for a variety of industrial hazards, every system is manufactured according to client specifications and may assume various configurations depending on the features that are selected standard systems are made of cylinder assemblies, valves, actuators, a manifold and discharge nozzles.

For each system, one or more cylinders are configured as pilot cylinders and therefore they are equipped with an actuator that provides local and remote valve opening.

The rest of the cylinders are configured as slave cylinders, hence they receive a pneumatic command from the pilots to open their own valve.

All cylinders are secured to a cylinder rack that may be a wall type, self-standing open type, or a self-standing closed cabinet

WARRNING

THE TRANSPORT CAP MUST ALWAYS BE FITTED ONTO THE CYLINDER, IRRESPECTIVE OF WHETHER THE CYLINDER IS FULL OR EMPTY, WHEN IT IS NOT CONNECTED TO THE MANIFOLD.

Co_2 Cylinder

High pressure CO2 system is a specialized fire extinguishing system designed to maintain the carbon dioxide supply at 21° C and 850 psig in strength alloy steel cylinders.

The cylinders contain the CO2 required to protect the largest single hazard.

On large hazards where several cylinders are required, a manifold is used to connect each cylinder by means of flexible hoses and check valves.

Cylinder valves control the CO2 flow to the hazard through properly sized pipe, terminating in nozzles that apply the CO2.

Flow rate is controlled by nozzle orifices as well as pipe sizes.

The cylinder master valves are electronically operated and the slave valves are pressure actuated.

The master valves can be automatically and/or manually operated.

Packing

CO_2 Cylinder

67.5 lit capacity each filled with 45 kg of

Body Material: Quenched and Tempered Steel 34 Cr Mo 4 DIN 17200

Capacity: 67.5 ltr. +5/0%
Weight: 76.2 Kg .+12%/-6%
Working pressure: 58 bar
Testing pressure : 250 bar
Explosion pressure: ≥ 472 bar
Design temperature: -20° ≈ +50°C
Painting: Red Painted

Complete with:

Siphon tube
Instruction label

Vítkovice Cylinders

CO_2 System used for

CO2 Extinguishing System Most Ideal For Protecting:

Paint and varnish manufacturing and processing areas.

Powder coating and Painting boots.

Transformers and substations.

Rolling mills and Turbines.

False Floors and cable shafts.

Engine test benches and SHIP Engine Room / compartments.

Printing machines.

Standard cylinder assembly for CO2 is equipped with a cylinder, a siphon tube and a valve. They are available in two configurations: pilot and slave. The pilot configuration comes with a solenoid valve and is used to initiate a system discharge, meanwhile the slave cylinder is actuated pneumatically upon activation of the pilot cylinder

Quick Discharge Valve

Pneumatic Valve

Non-rotating spindle valve can be opened by pneumatic (min. 30 up to max. 240 bar) and manual release mechanism

Valve can be activated manually when using stick-on lever (to be secured with a safety pin)

Equipped with bursting device (based on customers' specification)

VTI K85-50

Medium: CO2

Inlet thread:
25E according to ISO 11363-1

Outlet thread: W21,8x1/14“

Nominal diameter: DN 12

Working pressure: 200 bar

Bursting device on customer request

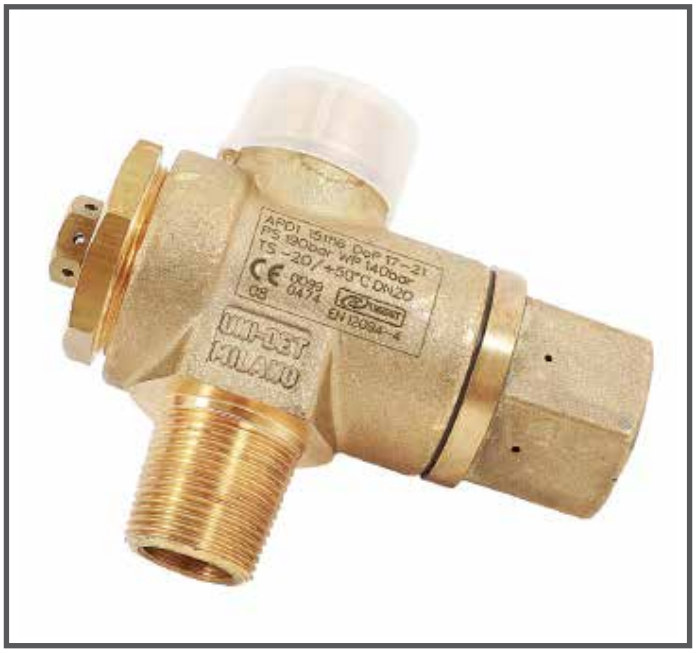
Dip tube thread: M16x1

Connection pneumatic cylinder:
2 x G3/8“ IG or 2 x 3/8-24UNF IG

Activation:
Manual, internal-pneumatic
TPED (BAM) and VDS approval
CPR- CE/ATR Typ

Quick Discharge Valve CO_2 Gas System

APD1:
¾" HIGH RATE DISCHARGE VALVE x CO2 WITH W25,4 M OUT THREAD – CERTIFIED



The APD1 is a ¾" high rate discharge valve with W25,4 M out thread. It is installed on TPED cylinders for CO_2 in domestic, industrial and marine environments (Except for those saturated with ammonia and sulphuric hydrogen vapours).

Its purpose is containing and then releasing carbon dioxide, which is used as extinguisher.

Certificate EN 12094-4

Certificate PED 2014/68/UE

Certificate CE-TPED-IT-200029 2010/35/UE

Certificate CE-TPED-IT-200030 2010/35/UE

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Quick Discharge Valve

The pneumatic actuator has a piston and it connected to a pin at the top of pressure differential head valve. When pilot pressure is applied to the piston pressure press the pin pushing the head valve diaphragm, thereby causing cylinder head valve to open.

SERIES B0480 FIRE CYLINDER VALVES

FOR CO2 GAS FIRE SUPPRESSION SYSTEMS

Quick Discharge Valve

Gas Type: CO2

Upper Limit Working Pressure: 250 bar

Orifice Size: 12 mm

Inlet connection: 25E EN-629-1

Outlet connection: W 21,8 x 1/14" DIN477

Valve Actuation: M 42 x 1,5

Dip tube connection: M 10 x 0,75

Safety Relief Pressure: 190, 225, 250

Body material: Brass

ROTAREX
VALVES - FITTINGS - REGULATORS

Key advantages:

- Available with a choice of burst disc pressures: 190 / 225 / 250 bar
- Total discharge type
- Medium-flow 12mm orifice
- For a CO2 flooding system

ATEX Solenoid Fire Cylinder Valve

Key advantages:

ATEX-approved coil for potentially explosive environments
Used as a pilot cylinder for a liquid-based fire extinguishing system or a smaller installation using a single cylinder
Choice of 250 bar or 190 bar burst-disc pressures
Other burst-disc pressures available upon request
Special connections available upon request

SERIES B0439 ATEX SOLENOID FIRE CYLINDER VALVES

Total discharge solenoid fire cylinder valves

FOR CO2 GAS FIRE SUPPRESSION SYSTEMS

Gas Type: CO2

Upper Limit Working Pressure: 250 bar

Orifice Size: 7 mm

Inlet connection: 25E EN-629-1

Outlet connection: W21,8 X 1/14" DIN 477

Dip tube connection: M 10 x 0,75

Operating voltage: 24 V DC

Power consumption: 10 Watts

Safety Relief Pressure: 190, 250

Body material: Brass

ROTAREX
VALVES - FITTINGS - REGULATORS

SOLENOID FIRE CYLINDER VALVES

N_2 Pilot Cylinder

N_2 PILOT CYLINDER

Water capacity: 3 Lit
Medium: N2
Test pressure: 200/300 bar
Base: concave
Thread: 25E EN629
Design: ISO 9809-1
Certification: TPED and UN
Material: 34CrMo4

Gas Type: CO2
Upper Limit Working Pressure: 250bar
Orifice Size: 7 mm
Inlet connection: 25E EN-629-1
Outlet connection: W21,8 x 1 1/14" DIN 477
Dip tube connection: M 10 x 0,75
Operating voltage: 24 V DC
Power consumption: 10 Watts
Safety Relief Pressure: 250
Body material: Brass

SERIES B0439 SOLENOID FIRE CYLINDER VALVES
FOR CO2 GAS FIRE SUPPRESSION SYSTEMS

DIRECTIONAL VALVE

Rotarex

Key advantages:

Isolates discharge only in the zone where there is a fire

Includes valve + bracket + motor

Available in carbon steel or stainless steel versions

Choice of 5 diameters: 1”, 1.5”, 2”, 2.5” and 3”

Actuates discharge either pneumatically or manually

Valve and actuator assembly to isolate separate fire protection zones from the same cylinder rack

SERIES B0551 PNEUMATIC DIRECTIONAL VALVES

USED IN TOTAL FLOODING GAS FIRE SUP-PRESSION SYSTEMS

ROTAREX
VALVES - FITTINGS - REGULATORS

DIRECTIONAL VALVE

Uni-Det

OACL20Dxx: DIRECTIONAL VALVES PN250 SOLENOID 24Vdc + DOUBLE ACTING ACTUTOR

The OACL20Dxxx are directional valves PN250 with double acting actuator Pi 5-10 bar. They permit to handle the flow of extinguisher into different parts of the system which are carried in environments protected with only one batch pf cylinders.

The activation is pneumatic directly or electrically with solenoid valve 24Cdc, through source of external pressure to the system or with the pressure of pilot line reduced to maximum values of P≤Pi.

Certified PED 2014/68/UE and EN10204 3.1.

Size: 1/2", 3/4, 1", 1 1/4", 1 1/2", 2", 2 1/2", 3", 4"

OACL20R-xx: DIRECTIONAL VALVES PN160 SOLENOID 24Vdc DOUBLE ACTING ACTUATOR

The OACL20Rxxx ARE Directional valves PN160 solenoid 24Vdc in carbon steel with double acting actuator Pi 5-10 bar. They permit to handle the flow of extinguisher into different parts of the system which are carried in environments protected with only one batch pf cylinders.

The activation is pneumatic or electrically with solenoid valve 24Cdc, through source of external pressure to the system or with the pressure of pilot line reduced to maximum values of P≤Pi.
Certified PED 2014/68/UE and EN10204 3.1.

SELECTOR VALVE

Uni-Det

The VDAR-1N is a directional piston valve 1” NPT FF. It is used with a centralized system of inert gas extinguishing and halocarbon for the protection of multiple environments alternately.

The activation is pneumatic or manual.

Certified EN10204 3.1.

The valve VDAR-11-2N is a piston directional valve 1″½ NPT FF. It is used with a centralized system of inert gas extinguishing and halocarbon for the protection of multiple environments alternately. The activation is pneumatic or manual.

This product is certified PED 2014/68/UE and EN10204 3.1.

VDAR-1N:
PISTON DIRECTIONAL VALVE DN 1”

VDAR-11-2N:
PISTON DIRECTIONAL VALVE DN

DIRECTIONAL VALVE

Arka Sanat

Arka Sanat's Directional Valve

When Two or more areas are to be protected using a same bank of CO2 cylinders, a Directional Valves is installed in each of the CO2 main feed pipe leading to the designated areas. CO2 gas from pilot cylinders connected to the inlet port will open valve.

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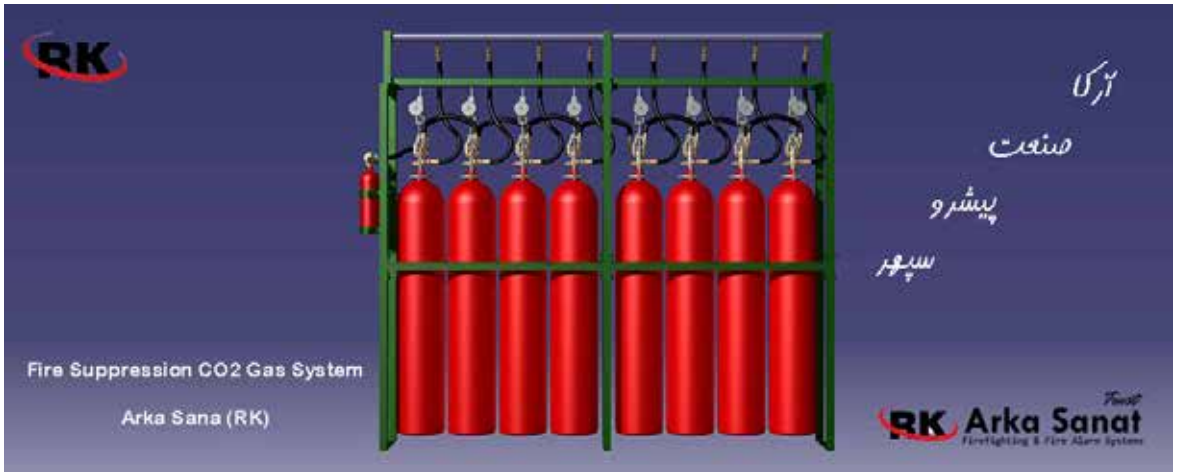
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Fire Suppression CO2 Gas System
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LOCK-OUT VALVE

OACLxx+BOX is a A105/316 manual lock-out valve for Fixed firefighting systems. The Manual lock out valves are realized in according to the norms ASME B16,34/BS EN ISO 17292.

All manual lock out valves are tested in according to: ISO 5208/BS6755 Parte1/API 598/ API6D/EN 12266. This type of valve is used on the main pneumatic lines of a firefighting system, as lock out valves, which activated, it disable the release of extinguisher.

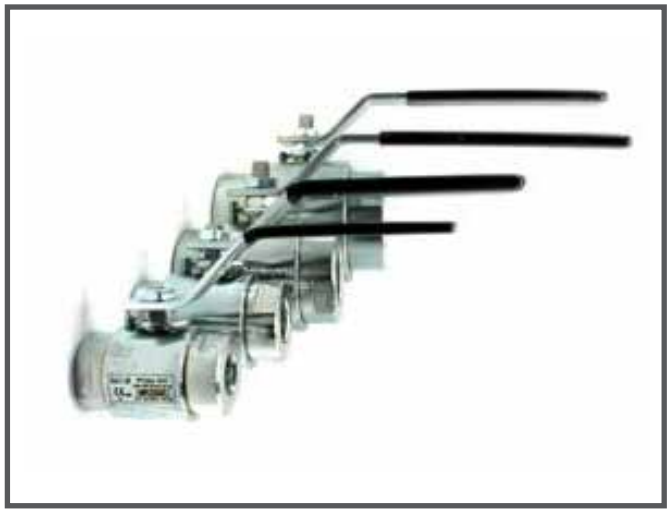
It prevents accidental activations of the distribution during the maintenance without excluding the fire detection and alarm.

In accordance to EN12094-6:2006, certified PED 2014/68/UE and EN10204 3.1.

These valves are supplied with our code BOX-DFST.

The series of Limit switches is designed to give a precise position of the valve and a reliable signal with relative indication on the remote controller in order to be able to monitor the system service status and, consequently, supervise the start and end maintenance operations.

Position indicator 0 – 90 °, (Yellow / Red). SB series of box with direct visualization and remote signal –IP66.



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CO_2 System Check Valve

The VRU-PG check valve in stainless steel 316 is installed on the systems where there is the requirement to control the fluid, for directing the flow in only one direction.

It is designed and certified for Firefighting systems for CO2, inert gas, HFC with maximum working pressure of 362bar.

It is supplied with DoP in accordance with EN 12094-13 norms.

Check valve in line has the purpose to get the free circulation of flow in an only direction, inside the circuit and to prevent the passage in that opposite. Its form facilitates the taking, during the assemblage. The conic bolt guarantees the hermetic sealing and the rubber band of contrast. It's in high resistance material (in phase of opening it doesn't close itself at package).

It's available in standard version with unblocking pressure at 0.5 bar and on request at 2-4-6-8-10 bar.

Certified CPR EN12094-13

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CO_2 System
Safety Valve

The code APE4 is a ¾" NPT M safety valve in nickel-plated brass. It has a safety disc to 140 Bar.

It is usually mounted on the manifold to protect it or the accessories mounted on the manifold (for example the pressure reducers or directional valves).

APE4: ¾" NPT M SAFETY VALVE

140 bar OPEN-AIR DISCHARGE

Certification PED 2014/68/UE.

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PRESSURE SAFETY VALVE FOR MANIFOLDS - USED IN TOTAL FLOODING GAS FIRE SUPPRESSION SYSTEMS

Safety pressure-relief device to prevent manifold over-pressure during discharge

Used in total flooding fire protection systems.

Key advantages:

Spring-loaded design closes after over-pressure is relieved

Relief pressure 66 bar at 20° C / 971 psi

Exceptional quality for dependable fire suppression performance when it counts

Long service life for cost-effective fire protection

SPECIFICATIONS:

Product Code: 029730037

Upper Limit Working Pressure:
66 bar bar (957 PSI)

Relief Pressure: 66 bar bar @ 20 C

Used to Gas Suppression System:
CO_2, IG-01, IG-55, IG-100, IG-541

Inlet connection: G 1/2”

CO_2 System

Manifold

Pipe Schedule 80 with Threadolet

Arka Sanat's High Pressure Galvanized Manifold System:

Galvanized High Pressure Manifold Pipes of diameters 1 1/4"-3".

Galvanized High Pressure Manifold Tee pieces of 3/4" inlet & outlet 1 /4"-3"

Galvanized High Pressure Manifold Blind Caps 11/4"-3".

Galvanized High Pressure Manifold Reducing Couplings 1 1/4",1 1/2", 1 3/4", 2", 2 1/2", 3"

Brass Non Return Valve 3/4"-3/4".

Discharge Hose Pilot Hose for CO_2 System

The flexible discharge hoses are made to convey the CO2 gas from the cylinder head valves to the main manifold for gas distribution to nozzle piping network. The Discharge Hoses are equipped with an internal check valves to prevent the back flow of CO2 gas from the manifold to other cylinders.

The pilot flexible hose is used to interconnect the ports of the pressure actuators. The CO2 gas pressure applied on the pressure actuators open the cylinder valve simultaneously.

Operating Pressure: 240 barg.

Test Pressure: 400 barg.

CO_2 System Nozzle

Arka Sanat

Two types of discharge nozzle are available: total flooding type and local application type.
Total flooding nozzles are used where an even distribution of gas is required throughout an enclosure.
Local application or directional nozzles are used where a concentration of carbon dioxide is required on a particular surface or piece of equipment.
Nozzles are designed to discharge large volumes of carbon dioxide without freezing. For local application use (when installed in accordance with their approvals), the velocity of discharge from the nozzle is reduced to prevent agitation and splatter of the hazardous material which could spread the fire.
All nozzles have a drilled orifice. The nozzle orifice size will vary depending on the flow and the location of the nozzle in the system. It is important that nozzles are installed exactly as specified on the project drawings, otherwise system performance will be jeopardized.
The wall type and vent type nozzles are used exclusively for total flooding installations. The S-Type nozzle may also be used for total flooding installations, however, its cost normally restricts its use to local application installations. The S-Type nozzle may be fitted with flanges to enable it to be mounted onto sheet metal equipment enclosures and ductwork. It may also be supplied with a frangible disc to prevent clogging of the orifice. Special finishes for nozzles are available and can be provided by special order to suit project requirements.


It is better to fail
in originality than to
succeed in imitation

CO2 Cylinder Support

Arka Sanat (RK)

The cylinders can be arranged to be bracketed to a wall or to be free standing when no wall is available.
Straps for single cylinder wall mounting installations are available from Arka Sanat.
Brackets for multiple wall mounted installations and frames for multiple cylinder free standing installations are normally supplied by the installer, and assembled on site to suit the space available

Double row, free standing arrangements have the advantage (particularly for systems using main and reserve cylinders, and for joint systems), that any cylinder can be removed for recharging without disturbing the others. However, this arrangement requires two aisles and considerably more space.
The double row, wall mounting arrangement is generally used when sufficient space is not available for a free standing arrangement or for a single row wall mounting arrangement.
For marine applications, additional cylinder supports are required. Two straps or sets of retainers must be used.

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CO2
Gas System

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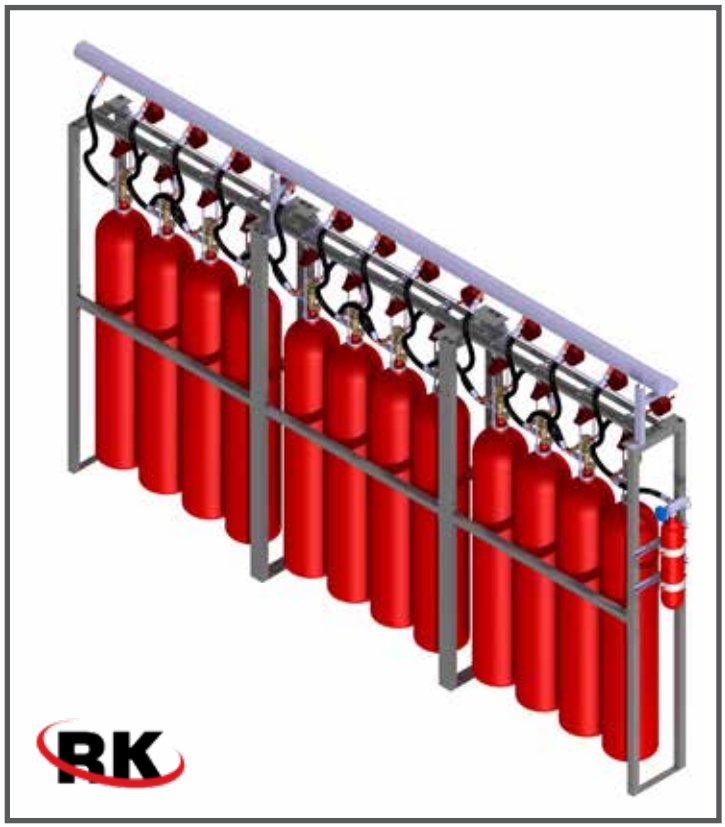
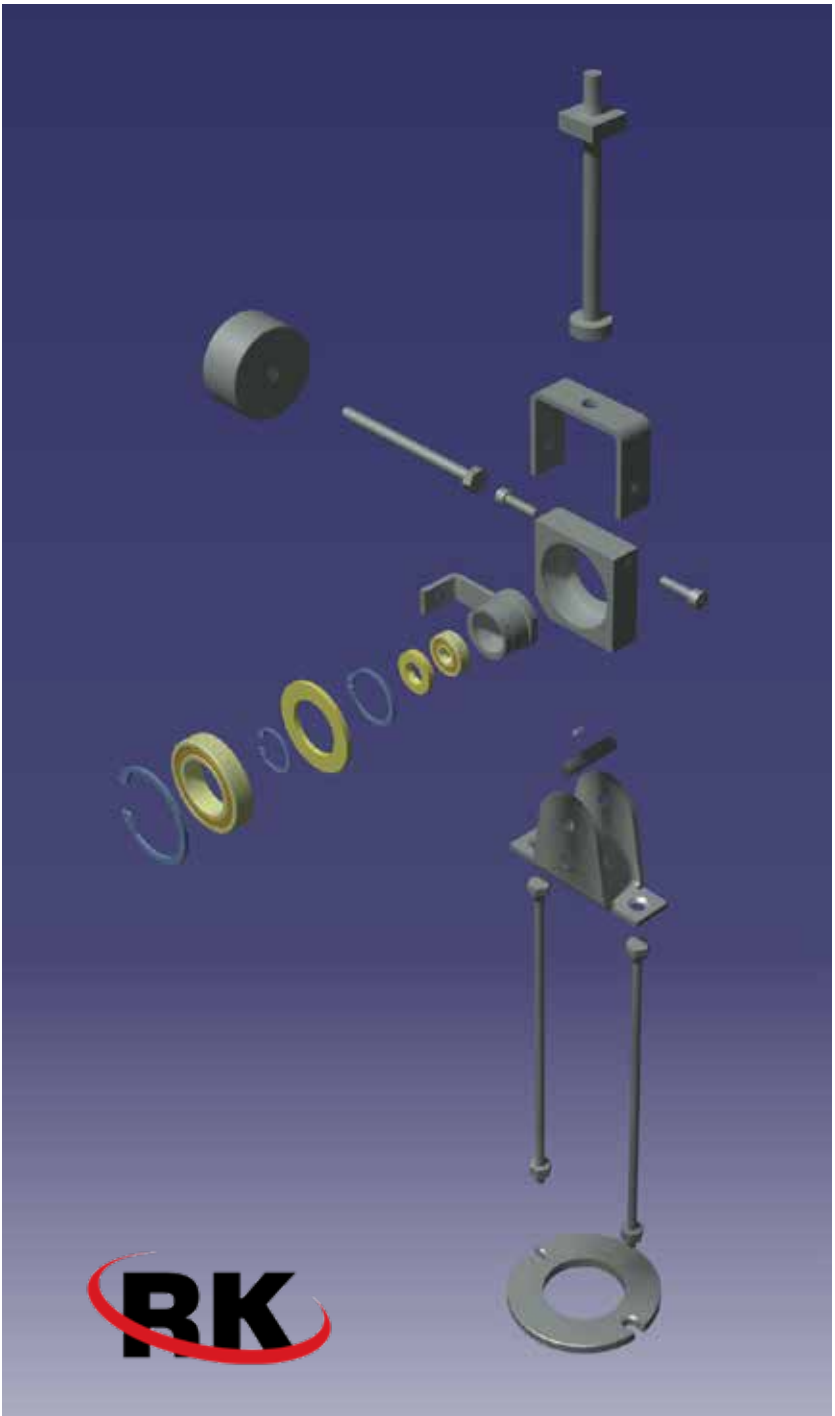


Mechanical Weighting Device for CO_2 Cylinder

The Arka Sanat's weighing device may only be used in accordance with the documentation of special extinguishing systems.

The weighing device is used in cylinder racks, single cylinder systems and pneumatic release devices and serves to loss indication of pilot control cylinders and extinguishing cylinders.



The weighing device must be adjusted by positioning the counter-weight in such a way that the indication is given at a loss of 5 % - 10 % of the extinguishing agent. For this purpose, the weighing device must be adjusted to a loss of 5 %. In case of extinguishing agent loss the counter-weight of the weighing device tilts downward and thus indicates the loss directly.
The loss of extinguishing agent can also be electrically indicated by using a monitoring

Note:

The usage under outdoor exposure is not allowed, this means, that the weighing device may not be exposed to rain, snow, severe dust exposure or the like.

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