

# **Breathing air**





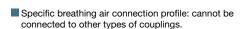
Safety right along the line,

For more than 20 years, Stäubli has been developing a comprehensive programme dedicated to the Breathing Air supply lines for all your personal protective equipment.

Stäubli choice: living up to expectations!

- guarantee of performance, our Breathing Air range benefits from more than 50 years of expertise in fluid connection technology and from an excellent understanding of your applications.
- true partners in your projects, our experts will duly advise you, providing efficient and innovative solutions.
- safety mastered in all aspects with a comprehensive range, incorporating supply, connection, filtering and distribution functions, as well as others.

# Stäubli: your project partner! Constantly









seeking innovation



performance across the whole range

# Stäubli quality, a guarantee of your safety!

Real lifelines, your Breathing Air lines must be perfectly reliable.

Our answer to such demands lies in the complete Breathing Air range, benefiting from enhanced quality-control procedures:

- compliance with standards and regulations
- compliance with safety standards (EN 12 021, EN 14 594, EN 14 593-1 and EN 14 593-2)\*
- blue colour for visual identification
- taking account of the conditions of use and environment
- mechanical keying of the circuits
- strong materials
- dedicated inspection procedures and equipment
- individual operation and leak-tightness tests
- yearly / weekly batch identification.

Applications	Products	Pages
Principle of breathing air supply		4 & 5
Connection to the instrument or breathing air circuits	AQR 08, AQR 11 and AQR 19 quick couplings	6 to 11
Direct connection to Personal Protective Equipment (masks, half suits and ventilated suits)	AQR 06 quick couplings	6 to 11
Connection for supply to distribution equipment and filtering units	AQR 11 and AQR 19 quick couplings	6 to 11
Comprehensive solutions with flexible tubing equipped to receive Breathing Air	TQR decontaminable flexible tubing HQR spiral hosing	12 to 15
Transformation of instrumentation air into Breathing Air	BQR 180 filter unit	16 to 19
Simultaneous supply to several PPE	DQR manifold unit	20 & 21
Hose reels for the flexible tubing supplying Breathing Air	EQR automatic and manual hose reels	22 & 23

 $<sup>^{\</sup>star}$  Our equipment consists of components. As such, it is your responsibility to: - identify the standards and regulations applicable to your installation

<sup>-</sup> ensure that the components are correctly incorporated into your installation

<sup>-</sup> check that your installation complies with the applicable legislation.

From the breathing air circuit to the personal protective equipment (PPE): Stäubli safety and performance

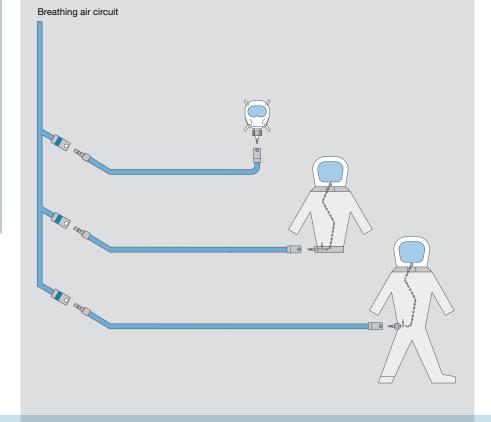


# Reminder

To be qualified as "Breathing air", it is necessary that the air of your circuit fills the conditions below:

- ☑ Filtration of gases
  CO and CO₂
- ☑ Drying of air
- ☑ Elimination of sprays and vapors of oil
- ☑ Deletion of the solid particles
- ☑ Elimination of odours

# Direct connection from the PPE to the breathing air circuit

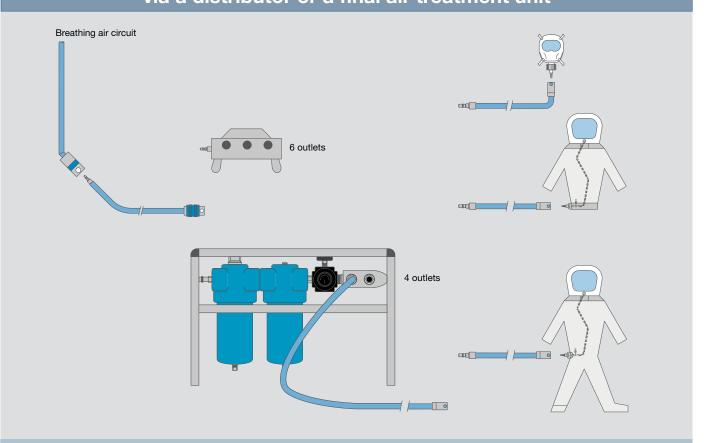


Stäubli Solutions

- Breathing air hoses: straight, spiral, drums
- Safety quick couplings for connection and breathing air network tapping of personal protective equipment



# Simultaneous supply of some PPE via a distributor or a final air treatment unit



- Breathing air hoses: straight, spiral, drums
- High flow quick couplings for connection and breathing air network tapping
- Manifold unit
- Final air treatment unit (eliminate the risk of pollution, between the breathing air circuit and the user, in particular over large distances)
- Safety quick couplings for connection of personal protective equipment

# AQR automatic quick couplings



# **Applications**

Quick connection for Instrument Air or Breathing Air network tapping.

Connection of high flow equipment: distribution units, mobile trolleys, filter units...

Secure connection for the Breathing Air supply to Personal Protective Equipment (masks, half suits and ventilated suits).

# Connection solutions with two things in common - safety and performance

Depending on the type of installation and the equipment to be connected, the requirements in terms of flow volume, accessibility, security and standardisation differ.

In order to provide a precise and perfectly matching solution to each of your needs, the AQR range comes with 4 diameters and includes numerous options.

# Your safety; our priority

 The AQR range provides mechanical foolproof matching preventing accidental connection to other circuits (compressed air, inert gases...).

Because of their special profile, AQR plugs only connect to AQR sockets.

- On disconnection, and thanks to the anti-hose whip technologies, there is no risk of violent ejection of the flexible tubing due to residual pressure in the hose (AQR 08 - 11 - 19).
- The colour blue and the "Breathing Air" marking provide easy and quick identification for Stäubli Breathing Air connections.







# Efficiency and simplicity of push button technology

Automatic connection and disconnection for a high level of comfort in use.

# **Product batch identification**

for traceability. 4

# Long term leak-tightness

The whole of the AQR range benefits from the specific quality of Stäubli technology, construction and inspection and guarantees long term reliability.



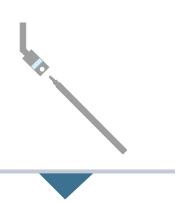


# Construction

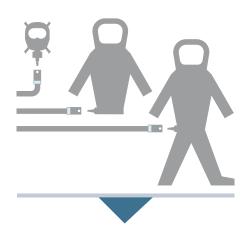
Coupling body: stainless steel. Plug: high-resistance chromium steel. Seals and dust cap: Nitrile (NBR).

# Recommendations

- For the safety of operators, couplings should only be used on "Breathing Air" circuits, all other fluids, gases or liquids being excluded.
- During lubrication, only use the G86 Stäubli lubricant - "Breathing Air" quality.







Network tapping for Personal Protective Equipment supply:

- AQR 11 or AQR 19 for several types of PPE, via a distribution or filter unit.
- AQR 08 for 1 PPE.

Connection of high flow mobile equipment (filter units, distribution units, mobile trolleys, ...):

- AQR 11 or AQR 19 at the inlet
- AQR 08 at the outlet

Direct connection from the PPE to the Breathing Air supply:

- AQR 06/DM

# AQR 11 and AQR 19 quick couplings

- AQR 11 and AQR 19 plugs in the /DL version prevent foreign matter entering the circuit and provide slow venting on disconnection (recommended for very long hoses).
- To retain the ergonomics while providing a high flow volume, the AQR 19 coupling has a "Raised push-lock" option that simplifies connection and disconnection.
- If necessary, and to prevent accidental disconnection of the coupling depriving the operator at the end of the line of Breathing Air, the AQR 11 socket can be equipped with a safety padlock.

# • AQR 08 quick couplings

- Available in a "panel mounted" version for hidden pipework necessitating flush fitting couplings.
- "Raised push-button" version, especially suitable for frequent disconnection, and use with working gloves.

# AQR 11 and AQR 19 quick couplings

Thanks to a design dedicated to ergonomics, AQR 11 & 19 couplings are very easy to handle even though they are dimensioned for high flow volumes.

### • AQR 08 quick couplings

Once fitted to your equipment, couplings must be easy to connect and disconnect.

This is why they are fitted with an **orientable button**, to be positioned for maximum accessibility. 4

# • AQR 06/DM quick couplings

- Designed to eliminate any risk of accidental disconnection, 2 separate actions are required to disconnect the couplings:
  - > step 1 : push the plug towards the socket
- > step 2 : press the button.

Disconnection is very easy, and only occurs when required.

- Conformity with EN 14 593-1, EN 14 593-2 and EN 14 594 safety standards



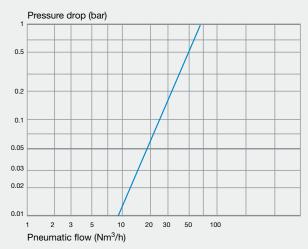
Many options for your connections, perfectly matched to every one of your applications



Technical features	AQR 06	AQR 08	AQR 11	AQR 19	
Ø straight through flow path (mm)	5	7,2	10,5	17	
Cross section (mm²)	19,6	40,6	86,0	230	
Max. working pressure (bar)	10	10	10	10	
Working temperatures (°C)	- 10 to + 65	- 10 to + 65 - 10 to + 65 - 10 to		- 10 to + 65	
Shut-off	single	single with slow decompression plug			

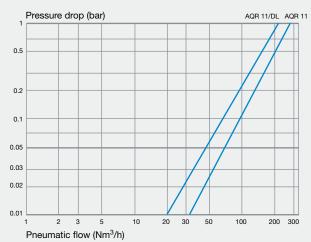
# Flow chart / pressure drop

### **AQR 06**



AQR 06.1152/IA/DM socket - AQR 06.6101 plug

### **AQR 11**

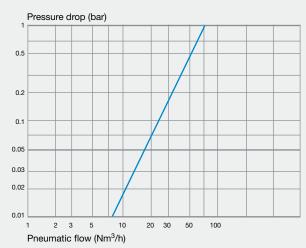


AQR 11.1154/IA socket - AQR 11.6104 plug

### **Test conditions**

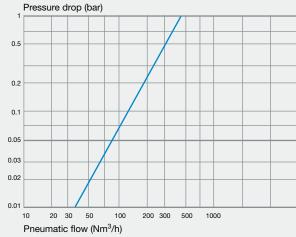
- Flow direction: Socket → Plug
- Inlet pressure: 6 bar

### AQR 08



AQR 08.1152/IA/OD socket - AQR 08.6103/DL plug

### **AQR 19**



AQR 19.1152/IA/OD socket - AQR 19.6154/IA/DL plug

# Sealing-kit

- Composed of a 316L stainless steel retaining ring and a nitrile O-ring seal, the KES ensure a perfect sealing between the socket and your support.
- The compatible couplings with this option are characterized by the logo " in part-number charts. The sealing-kits must be ordered separately.

For more information, please see our KES documentation RP003.

AQR 06			F	L (mm)	L1 (mm)	Part-numbers
Socket, male threading with leak-proof 60° cone		FT F	G 1/4 G 3/8 G 1/2	52 52 52	11 12 14	AQR 06.1151/IA/DM AQR 06.1152/IA/DM AQR 06.1153/IA/DM
Socket, female threading	(CE)	<sup>024</sup>	G 1/4 G 3/8 G 1/2	62 62 67	-	AQR 06.1101/IA/DM AQR 06.1102/IA/DM AQR 06.1103/IA/DM
Plug with full flow, male threading with leak-proof 60° cone	æ	<u>L</u>	G 1/4	40	11	AQR 06.6151
Plug with full flow, female threading		L L	G 1/4	50	-	AQR 06.6101
Accessory: socket anti-dust	protective	e cap (rubber)				AQR 06.8500/DM
Accessory: plug anti-dust pr	otective c	ap (rubber)				RBE 06.8550/BC
AQR 08			F	L (mm)	L1 (mm)	Part-numbers
Socket with shut-off valve, male threading, with leak-proof 60° cone		4.850 FT	G 1/4 G 3/8 G 1/2	61 61 61	11 12 14	AQR 08.1151/IA/OD* AQR 08.1152/IA/OD* AQR 08.1153/IA/OD*
Socket with shut-off valve and adjustable button, male threading, with leak-proof 60° cone		hex. 25	G 3/8 G 1/2	80 83	19 22	AQR 08.1152/IA/OD/VO AQR 08.1153/IA/OD/VO
Socket with shut-off valve, female threading	(ES	P. 629.4	G 1/2	75	-	AQR 08.1103/IA/OD*
Socket with shutt-off valve, panel mounted, male threading, with leak-proof 60° cone	æ	11.5 max.	G 1/4 G 3/8 G 1/2	61 61 61	11 12 14	AQR 08.2151/IA/OD AQR 08.2152/IA/OD AQR 08.2153/IA/OD
Option: Raised push button - VD code to be added to the base reference.		029.8	-	-	-	ex.: <b>AQR 08.1152/IA/VD/OD</b>
Slow venting plug, male thread, with leak-proof 60° cone		<u>L</u>	G 3/8 G 1/2	72 72	12 14	AQR 08.6152/DL AQR 08.6153/DL
Slow venting plug, female thread			G 1/4 G 3/8 G 1/2	78 80 85	-	AQR 08.6101/DL AQR 08.6102/DL AQR 08.6103/DL
Accessory: socket anti-dust protective cap (rubber) (not compatible with the VD option)					AQR 08.8500	
Accessory: plug anti-dust protective cap (rubber)					RBE 08.8550/BC	

<sup>\*</sup> Also available in stainless version, IC quality for application in corrosive environment: replace IA/OD code by IC/OD at the end of the part-number.

AQR 11			F	L (mm)	L1 (mm)	Part-numbers
Valved full flow socket, male threading, with leak-proof 60° cone		177	G 1/2 G 3/4	96 96	14 16	AQR 11.1153/IA AQR 11.1154/IA
Valved full flow socket, female threading		747	G 1/2 G 3/4	101 106	-	AQR 11.1103/IA AQR 11.1104/IA
Option: Safety Lock (padlock) - add code VS to the base reference.		25	-	-	-	ex.: <b>AQR 11.1104/IA/VS</b>
Plug with full flow, male threading, with leak-proof 60° cone		<u>L1</u>	G 1/2 G 3/4	51 53	14 16	AQR 11.6153 AQR 11.6154
Plug with full flow, female threading		L L	G 3/4	69	-	AQR 11.6104
Slow venting plug, male thread, with leak-proof 60° cone		L L	G 1/2 G 3/4	85 85	14 16	AQR 11.6153/DL AQR 11.6154/DL
Slow venting plug, female thread		L	G 1/2 G 3/4	94 97.5	- -	AQR 11.6103/DL AQR 11.6104/DL
Accessory: plug anti-dust pro	otect	ive cap (rubber)				RBE 11.8550/BC
AQR 19			F	L (mm)	L1 (mm)	Part-numbers
Socket, male threading,			G 3/4	102.5	16	AQR 19.1154/IA/OD
with leak-proof 60° cone		2 plats 46	G 1	100.5	20	AQR 19.1155/IA/OD
Socket, female threading		200	G 3/4	115	-	AQR 19.1104/IA/OD
,		2 plats 46	G 1	115	-	AQR 19.1105/IA/OD
Option: Raised push button - VD code to be added to the base reference.						ex.: <b>AQR 19.1154/IA/OD/VD</b>
Plug, male threading,	<del></del>		G 3/4	122.5	16	AQR 19.6154/DL
with leak-proof 60° cone		L1 hex. 41	G 1	122.5	20	AQR 19.6155/DL
Plug, female threading (	<u></u>	L L	G 3/4	129.5	-	AQR 19.6104/DL
g, remain an outling	hex. 41		G 1	135.5	-	AQR 19.6105/DL
Accessory: socket anti-dust p	Accessory: socket anti-dust protective cap (stainless steel)					AQR 19.8500
Accessory: plug anti-dust protective cap (rubber)					RBE 19.8550/BC	

# Equipped hose TQR



# **Applications**

Supplying Breathing Air to the Personal Protective Equipment (masks, half suits and ventilated suits).

Supplying air between network tapping and the distribution units.

For all types of industries, including: nuclear, chemical, petrochemical, pharmaceutical, asbestosremoval projects...

Compliance with the EN 14 593-1, EN 14 593-2 and EN 14 594 standards.

# **Decontaminable hose**

particularly recommended for nuclear applications.

# **Easily identified**

Blue-coloured.

# Adaptability

- 3 diameters available:
- Ø 10
- Ø 13
- Ø 19
- Several lengths of hose available.

# **Heat-resistant**

# **Ergonomic**

- Light
- Flexible

# **Antistatic properties**

25 000  $\Omega$  according to standard current.







# Construction

Inside tube: PVC

Reinforcement: Textile weave Outside layer: Decontaminable PVC

Colour: blue (RAL 5015)

Hose: each end equipped with a 316 L crimped stainless-steel fitting with traceability

Technical features		TQR 10	TQR 13	TQR 19
Hose Ø int./ext. (mm)		10 x 16	13 x 20	19 x 28
Working temperatures (°C)		- 20 to + 60	- 20 to + 60	- 20 to + 60
Max. operating pressure at 20° C (bar)		10	10	10
Bend radius (mm)		40	70	90
Weight per metre (g)		160	230	420
Female threaded swivel with seat for 60° cone	Э	G 3/8	G 1/2	G 3/4
ACD range competibility	Plug	AQR 08.6152/DL	AQR 08.6153/DL	AQR 11.6154/DL
AQR range compatibility	Socket	AQR 06.1152/IA/DM	AQR 06.1153/IA/DM	AQR 11.1154/IA/OD

Length	TQR 10	TQR 13	TQR 19
5 m	TQR10M005	TQR13M005	TQR19M005
10 m	TQR10M010	TQR13M010	TQR19M010
15 m	TQR10M015	TQR13M015	TQR19M015
20 m	TQR10M020	TQR13M020	TQR19M020
25 m	TQR10M025	TQR13M025	TQR19M025
30 m	TQR10M030	TQR13M030	TQR19M030
40 m	TQR10M040	TQR13M040	TQR19M040
50 m	TQR10M050	TQR13M050	

Other lengths: please enquire

For optimal safety and in order to protect from dust, the ends of our flexible tubing are systematically equipped with a protective cap when dispatched.

# HQR Hoses



# **Applications**

Supplying Breathing Air from ceiling-mountings.

Chemistry, research laboratories.

Compliance with EN 14 594 standard, category A.

# **Ergonomic**

Ideal for circuits coming from the ceiling, the Stäubli hose coil is very handy.

# **Compact**

A maximum of 7m working length and just 2m in a retracted position.

# **Easily identified**

Blue colour.

# Hose of food-packaging quality

dedicated to Breathing Air.

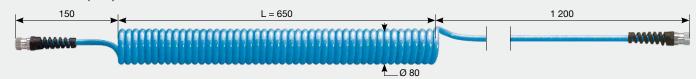




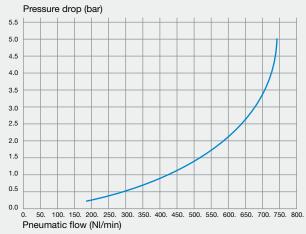




# **Dimensions** (mm)



# Flow chart / pressure drop



Measurement obtained using HQR 09.07.08 / AQR 06 + supply socket

# Construction

Polyurethane.

For optimal safety and in order to protect from dust, the ends of our hoses are systematically equipped with a protective cap when dispatched.

Silicone free.

Technical features	HQR 09
Pipe Ø int./ext. (mm)	9 x 13
Total working length (m)	7
Working temperatures (°C)	- 20 to + 30
Max. working pressure (bar)	10
Weight of the spiral hose equipped with 2 G 3/8 female fittings (kg)	1,040

Part-numbers	HQR 09
HQR flexible tubing equipped with 2 G 3/8 female fittings	HQR 09.M007/2AF102
HQR flexible tubing equipped with G 3/8 female fittings at the inlet AQR 06/DM socket at the outlet	HQR 09.M007/AF102/AQR 061
HQR flexible tubing equipped with AQR 08 plug at the inlet AQR 06/DM socket at the outlet	HQR 09.M007/AQR 086/AQR 061

# BQR 180 Filter unit



# **Applications**

Transformation of instrumentation air into "Breathing Quality" air for supplying air to personal protective equipment (masks, half suits and ventilated suits).

For all types of industries, including: nuclear, chemical and pharmaceutical industries, shipyards, asbestos-removal projects...

# Filter performance

# 2 stage filtration:

- level 1, sub-micronic filter for elimination of aerosols and solid particles.
- level 2, activated carbon filter for absorption of the oil vapor, aerosols and odours.

# **Clogging indicator**

**A regulator** allows adaptation of the filter unit pressure to that of the protection equipment.

# Adaptability

According to your needs, our filter unit is delivered:

- either, with no couplings,
- or, equipped with 2 AQR 08 sockets,
- or, equipped with 4 AQR 08 sockets.

# Ergonomics and performance

In addition to the qualities of the BQR 180 unit are those of Stäubli AQR 08 couplings:

- leak tightness
- safety
- ease of handling (especially with the adjustable button technology).

# No electrical outlet required



# Maximum flow D = 3,000 NI/mn

Breathing Air supply of: 8 masks or 8 half suits or 4 ventilated suits (according to the configuration below).

Fittings for the BQR 180 filter unit:

- Filter clogging indicator 1
- Relief valve 2
- Manometer 3
- Filter unit with no couplings: 1 AQR 11 plug at the inlet, 4 G 3/8 female threaded ports at the outlet.
- Filter unit with couplings: 1 AQR 11 plug at the inlet, 2 or 4 AQR 08 sockets at the outlet.
- Separately sold accessories: pack of 2 equipped castors. 4









To choose your filter unit, bear in mind the consumption of the personal protective equipment to be connected and the maximum flow of the filter unit.

Example calculation of the flow necessary for your application:

D = number of masks x 150 + number of half suits x 300 + number of ventilated suit x 600 based on the following consumption: 150 NI/mn for one mask, 300 NI/mn for one half suit, 600 NI/mn for one ventilated suit

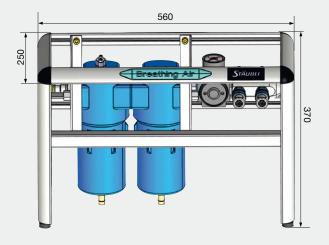
### Caution:

- The flow calculation should also include the pressure losses over the entire line (connectors + hoses)
- PPE consumption values are given for information only and should be checked with your equipment suppliers.



Technical features	BQR 180
Efficiency rate of stage 1 (Elimination of the aerosols and the solid particles)  Sub-micronic filter with clogging indicator	Up to 0.01 μ
Efficiency rate of stage 2 (Absorption of the oil vapor, aerosols and odours)  Activated carbon filter	Up to 0.003 mg/m³
Recommended max. output under 6-bar pressure (1-bar loss of charge inside the filter unit)	3,000 NI/mn
Max. operating pressure	10 bar
Weight of the equipped filter unit	15 kg
Construction	Aluminum profile frame with anodic protection

**Reminder:** CO and  ${\rm CO_2}$  gases cannot be filtered using this filter unit.



Part-numbers	BQR 180
Terminal fitted with 1 AQR 11 plug at the inlet and 2 AQR 08 sockets with swivel fittings at the outlet	BQR 180.02
Terminal fitted with 1 AQR 11 plug at the inlet and 4 AQR 08 sockets with swivel fittings at the outlet	BQR 180.04
Filter unit with 1 AQR 11 plug at the inlet and 4 G 3/8 female threaded ports at the outlet	BQR 180.00
Inlet plug	AQR 11.6154
Outlet sockets	AQR 08.1152/IA/OD/VO
Pack of 2 equipped castors	BQR 180.9000

Filter unit delivered with filters.

Spare parts	BQR 180
Stage 1 filter (To be changed once a year or when the indicator turns red)	FSB 02.8020
Stage 2 filter (To be changed twice a year or when the indicator turns red)	FSB 04.8020
Filter clogging with visual indicator	FSB 01.9002

# DQR Manifold unit



# **Applications**

Mobile system for simultaneous supply of various personal protective equipment with Breathing Air:

- 6 masks\*
- 6 half suits\*
- 4 ventilated suits\*

# Compactness

Minimal bulkiness for maximum efficiency (simultaneous supply of 6 masks).

# Convenience

The large handle enables the manifold to be easily moved.

# **Adaptability**

3 types of construction material available, thereby adapting to all uses.

- \* On the basis of consumption corresponding to:
- 150 NI/mn for one mask
- 300 NI/mn for one half suit
- 600 NI/mn for one ventilated suit

Warning: example values only; please check with the equipment supplier.





# Construction

body:

 anodised aluminium (not to be used in an ATEX atmosphere; must not be exposed to impact)

or

- nickel-plated brass

- "IB" stainless steel AISI 303

handle:

anti-scratch composite materials

stands:

anti-scratch composite materials with metallic reinforcements

Our distributors are delivered non-equipped.

We recommend that you fit an AQR 11 plug at the inlet and AQR 08/VO sockets (with orientable button) at the outlet. Please refer to our AQR range on pages 6 to 11.

Technical features	DQR
Max. working pressure (bar)	10
Working temperatures (°C)	- 10 to + 60
Supply: 1 internal thread	G 1/2
Outlets: 6 internal threads	G 3/8

Aluminium version	Nickel-plated version	Stainless-steel IB versio	
N 010 752 06	N 003 690 06	N 001 396 07	
1.38 kg	3.15 kg	2.94 kg	
6 G 3/8" internal	126.4	173 040 040 173 173	

# EQR Open drum hose reel



# **Applications**

Air network.

For all types of industries, including: nuclear, chemical, petrochemical, pharmaceutical, maintenance...

# Resistance

Manufactured in stainless steel.

# Easy to clean and maintain

Smooth surfaces.

# Winders equipped

with TQR 10, TQR 13 or TQR 19 hoses.

Automatic hose reels EQR 01.2010, EQR 01.2013 and EQR 02.2019



■ Manual hose reel with crank EQR 03.3013



Technical features	Automatic hose reel with Ø 10 mm TQR hose	Automatic hose reel with Ø 13 mm TQR hose	Automatic hose reel with Ø 19 mm TQR hose	Crank manual hose reel with Ø 13 mm TQR hose
Working length (m)	18	18	18	28
Hose colour	blue			
Max. working pressure (bar)	10			
Working temperatures (°C)	- 20 to + 60			
Inlet hose	2 m with TQR 19			
Length of TQR hose at the outlet (m)	20	20	20	30
Type of outlet fitting (rotating thread with seat for 60° cone)	G 3/8	G 1/2	G 3/4	G 1/2
Weight excluding hose (kg)	Hose reels with integrated directional support			
	35	41	43	32
Clearance angle	2 x 45°	2 x 45°	2 x 35°	2 x 35°

Part-numbers	Ø 10 mm hose	Ø 13 mm hose	Ø 19 mm hose
Automatic hose reel with Ø 10 or 13 mm hose  761  Angle de débattement: 2 x 45°	EQR 01.2010	EQR 01.2013	-
Automatic hose reel with Ø 19 mm hose  761  Angle de débattement: 2 x 35°	-	-	EQR 02.2019
Crank manual hose reel with Ø 13 mm hose	-	EQR 03.3013	-
Socket for outlet hose (optional)	AQR 06.1152/IA/DM	AQR 06.1153/IA/DM	AQR 19.1154/IA/OD

Connection accessories for inlet hose (optional)				
Stainless steel G 1/2 male hose stem for TQR 19 hose	AF 153.19.G2/IC			
Stainless steel G 3/4 male hose stem for TQR 19 hose	AF 154.19.G2/IC			
Hose clamp (2 collars per hose stem)	ABA 22.32/IB			

We reserve the right to make changes to our products without advanced warning.



# Global presence of the Stäubli Group

■ Stäubli units

Agents

# International sales coordination

Stäubli Faverges - CS 30070 - F - 74210 Faverges - Tel.: +33 4 50 65 67 97 - Fax: +33 4 50 65 60 69 - E-mail: connectors.sales@staubli.com www.staubli.com

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