Operating instructions BA 2019-002 Lab
for compressed air laboratory mixers and stirrers

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1. Important notices

1.1 Important note symbols

Failure to observe these danger and safety notices can lead to serious personal injury !

Danger

Information and safety notices

Important notices on explosion protection

1.2 Important general notices

The compressed air laboratory mixers from Buddeberg GmbH are explosion-protected according to the current ATEX regulation 2014/34/EU and are assigned to device categories II, zone 1 and 2 (gas atmosphere G) or zone 21 and 22 (dust atmosphere D), see marking on the stirrer.

Compressed air laboratory mixers of device category II include the explosion subgroups IIA, IIB and IIC, and can thus be used for mixing work in these areas.

2. Safety instructions

2.1 General safety instructions

Introductory remarks

Read through these instructions carefully before using the compressed air stirrer for the first time. Please also take account of the supplementary safety instructions in the individual chapters of these operating instructions.
During and after use, the stirring rotor and the moving parts may very possibly have hot surfaces.
All work with respect to setting-up, connections, commissioning, maintenance and repair may only be carried out by properly qualified specialist personnel. Improper use and incorrect installation or operation can lead to serious personal injury and damage to property.

Handling compressed air

- Always wear protective glasses.
- Do not remain in a direct line with the jet of compressed air.
- Do not attempt to operate the appliance with other gases or liquids.
- Do not operate the appliance with pressures higher than that which is recommended for it.
- Damage may occur if the appliance is operated at higher speeds than those recommended.

Use for the intended purpose

The compressed air stirrers are designed for all mixing tasks in the laboratory, technical colleges or in production for dispersion, emulsifying, homogenising, suspension and blending. They comply with all current standards and regulations and fulfil the requirements laid down by the Directive 2014/34/EU (ATEX). The technical data and the details of permitted conditions are to be found in this documentation with a declaration of conformity. **All specifications must be followed scrupulously! Buddeberg GmbH disclaims any liability arising from alterations undertaken to the compressed air stirrers and mixers without prior consultation with Buddeberg GmbH and the latter's written agreement.**

2.2 Additional safety instructions when used in potentially explosive atmospheres

Explosive gas mixtures or concentrations of dust in conjunction with hot and moving parts of the stirrer can lead to serious or even fatal injury.
All work with respect to setting-up, connections, commissioning, maintenance and repair may only be carried out by properly-qualified specialist personnel, taking into account

- these instructions and the declaration of conformity
- the warning and instruction labels on the stirrer
- all other documentation and commissioning instructions related to the stirrer
- any instructions and requirements specific to the plant
- currently-valid national/regional regulations (explosion protection, safety, accident prevention)

2.3 Hazards from ignition sources in the mixing container

- Monitoring the content level is prescribed in order to avoid the mechanical generation of sparks from friction, striking or wearing processes.
- To avoid electrostatic loading in liquids, these liquids must have a conductivity of $>10^{(8)}$ S/m.
- It must be ensured that the stirring level remains fully immersed during operation.
- The stirring container must be authorised for ATEX operations. If containers are made of plastic, these must be conductive. In case of doubt, clarify this with the manufacturer.

2.4 Sources of ignition from differences in potential

To avoid generation of sparks due to potential differences, an earthing cable must be firmly attached to the stirrer at the point provided.

2.5 Safety note in operation for the medium dust

Due to the overpressure in the compressed air motor, it cannot be ruled out that air lightly blows off the stirrer on the housing and on the drive shaft. Therefore, these areas are to be checked on a regular basis and cleaned if necessary to prevent the dispersion of dust.

3. Technical data

3.1 General technical data

Working pressure: maximum 6 bar, a reduction is permitted at any time

Temperature range: ambient temperature in normal operation (not potentially explosive atmosphere):
-20°C ≤ TA ≤ +80°C

Ambient temperature in a potentially explosive atmosphere: -20°C ≤ TA ≤ +40°C

The temperature of the compressed air used must not exceed the maximum permitted ambient temperature.

3.2 Specific technical data

Technical data sheet for compressed air laboratory stirrers						
Type	Power output watts	No-load speed rpm	Torque max. Nm	Pressure max. bar	Air consumption L/min. at 6 bar unstressed	Article No. EAN No.
PLM 38/260	380	260	19.0	6	500	4026446003746
PLM 38/580	380	600	8.6	6	500	4026446003753
PLM 38/1180	380	1100	6.3	6	500	4026446003760
PLR 10	200	15000	0.3	6	260	4026446002473
PLR 10 GA	200	15000	0.3	6	260	4026446004804
PLR 10T	200	15000	0.3	6	260	4026446002480
PLR 10T GA	200	15000	0.3	6	260	4026446004859
PLR 11	200	1900	3.5	6	260	4026446002510
PLR 11 GA	200	1300	3.5	6	260	4026446004811
PLR 11T	200	1700	3.5	6	260	4026446002534
PLR 11T GA	200	1200	3.5	6	260	4026446004866
PLR 12	200	1000	5.3	6	260	4026446002602
PLR 12 GA	200	750	5.3	6	260	4026446004828
PLR 12T	200	950	5.3	6	260	4026446002619
PLR 12T GA	200	750	5.3	6	260	4026446004873
PLR 13	200	80	19.8	6	260	4026446002688
PLR 13 GA	200	80	19.8	6	260	4026446004842
PLR 13T	200	80	19.8	6	260	4026446002695
PLR 13T GA	200	80	19.8	6	260	4026446004897
PLR 28	200	580	10.4	6	260	4026446003647
PLR 28 GA	200	450	10.4	6	260	4026446004835
PLR 28T	200	550	10.4	6	260	4026446003654
PLR 28T GA	200	400	10.4	6	260	4026446004880
PMR 10	200	15000	0.3	6	260	4026446002503
PMR 10 GA	200	15000	0.3	6	260	4026446006105
PMR 10T	200	15000	0.3	6	260	4026446007362
PMR 10T GA	200	15000	0.3	6	260	4026446007720
PMR 11	200	1800	3.5	6	260	4026446002596
PMR 11 GA	200	1300	3.5	6	260	4026446006037
PMR 11T	200	1800	3.5	6	260	4026446006235
PMR 11T GA	200	1300	3.5	6	260	4026446005788
PMR 12	200	1000	5.3	6	260	4026446002664
PMR 12 GA	200	750	5.3	6	260	4026446006129
PMR 12T	200	950	5.3	6	260	4026446006099
PMR 12T GA	200	750	5.3	6	260	4026446005795
PMR 13	200	80	19.8	6	260	4026446002701
PMR 13 GA	200	80	19.8	6	260	4026446007706
PMR 13T	200	80	19.8	6	260	4026446006273
PMR 13T GA	200	80	19.8	6	260	4026446007744
PMR 28	200	580	10.4	6	260	4026446003678
PMR 28 GA	200	450	10.4	6	260	4026446007713
PMR 28T	200	550	10.4	6	260	4026446006280
PMR 28T GA	200	400	10.4	6	260	4026446007737

3.3 Markings

Marking sample, type PLR 11:

Buddeberg GmbH Mallaustr. 49 68219 Mannheim	Manufacturer
PLR 11	Appliance type
max. 6 bar	max. pressure
Art. Nr. 4026446002510	Article number
Ser.Nr. 123456 / 2019	Serial number / year of manufacture
II 2G Ex h IIC T5 Gb	ATEX marking

Key to ATEX marking:

Gas	**Dust**	
II		equipment group
2		equipment category
G	D	for gas / dust atmospheres
c / Ex h		constructive safety / ignition protection type
IIC	IIIC	explosion group
T5	T4	temperature class
Gb	Db	equipment safety level

3.4 Temperature classes

The temperature classes designate the maximum permitted surface temperature of the used appliances.

The following appliance types are classified in temperature class T4 (max. 135°C):
PLR 10, PLR 10 GA, PLR 10T, PLR 10T GA, PMR 10, PMR 10 GA, PMR 10T, PMR 10T GA
as well as D models for dust atmospheres.

The following appliance types reach temperature class T5 (max. 100°C):
PLM 38, PLR 11/12/13/28, PLR 11T/12T/13T/28T, PLR 11GA/12GA/13GA/28GA, PLR 11T GA/12T GA/13T GA/28T GA/, PMR 11/12/13/28, PMR 11/12/13/28 GA, PMR 11T/12T/28T/13T, PMR 11T GA/12T GA/13T GA/28T GA

4. Installation

4.1 Before you start

The compressed air stirrer may only be assembled when the details on the rating plate correspond with the permitted potential explosive atmosphere on the site and the stirrer is undamaged.

4.2 Pneumatic installation

For maximum safety, performance and service life, the compressed air laboratory stirrers and mixers should be operated with a maximum air pressure of 6 bar and a corresponding compressed air tubing (see accessories). The working air must be clean and dry (insert a service unit for this purpose). Do not use worn or damaged compressed air tubing or connections. Care must be taken that all tubing and connections are of the correct size.

4.3 Adjustment

- Lubrication: For continuous operation a lubricator is to be installed in the compressed air feed, and it must be set to feed one drop of oil per approximately 2 m^3 compressed air.

- Speed regulation: The speed of the stirrer is controlled by the valve mounted on the stirrer.

4.4 Fitting on the stand

For use as intended the compressed air laboratory stirrer must be fixed to a stable stand (see accessories) by means of a bosshead (see accessories).

4.5 Fitting the connection coupling

In ex-operation, only use the connection couplings from our range of accessories. Please note that, for safety reasons, drill chucks may not be used in potentially explosive areas.

Separate the stirrer from the compressed air supply.

Before fitting the connection coupling, ensure that the take-off shaft from the stirrer is neither dirty nor damaged. Fasten the connection coupling to the drive shaft of the motor and fix the locking screws using a suitable tool.

4.6 Fitting the stirring rotor

Separate the stirrer from the compressed air supply.

Before fitting the stirring rotor, ensure that the stirrer shaft is neither dirty nor damaged. Fasten the stirring rotor to the connection coupling provided and fix the locking screws using a suitable tool.

5. Putting into service

- **Before connecting to the compressed air supply and putting into service, ensure that the valve on the stirrer is closed.**
- Check that the pressure is at max. 6 bar from the compressed air supply. This will guarantee an optimum start when the speed regulator valve is opened.
- For reasons of safety, the stirrer container must be fixed with a clamp holder (see accessories).
- Compressed air laboratory stirrers and mixers must not be allowed to operate under no-load conditions. The stirring rotor must be constantly immersed in the liquid.
- Only use stirring rotors from the range of accessories provided. Wait until the motor has come to a standstill and the compressed air supply is disconnected before removing the stirring rotors.
- Disconnect the compressed air stirrers and mixers from the compressed air supply once the working process is completed.

6. Maintenance and repair

- Maintenance and repairs may only be carried out by the manufacturer or trained personnel. If the compressed air laboratory stirrer is faulty, please contact the manufacturer.
- Only original Buddeberg replacement parts may be used.
- Before maintenance work is carried out, the compressed air stirrer or mixer must be disconnected from the compressed air supply.
- The filter in the service unit must be cleaned regularly and emptied of condensate while the stirrer is in use.
- Check the oil level regularly in the lubricator and top up as necessary.
- In order to conform to the safety regulations in accordance with the ATEX Directive 2014/34/EU, vanes and ball bearings need to be changed immediately on deterioration of power. Please contact the manufacturer.

7. Lubrication

- <u>Only use the types of lubricating oil listed below:</u>
  Shell – Tellus HL/HLP 32 | Aral – Vitam GF 32 | BP – Energol HL P 32 | Fuchs Renolin B 10

- <u>Only use the types of lubricating grease listed below:</u>
  Fuchs – Renolit LX-GFL 0/00

- <u>When used in the food industry:</u>
  Food grade oil according to USDA-H1 and/or FDA 178.3570 viscosity class 32
  Grease: USDA-H1 and/or FDA 178.3570. NLGI class: 2 – DIN 51818

8. Guarantee

The manufacturer provides a guarantee of 12 months on material and construction defects. Damage arising from wear, overuse or improper use is not covered by the guarantee.

9. Accessories

9.1 Accessories

	Article no.
Floor stand	4026446000868
Bosshead KR 260	4026446003869
Clamp holder	4026446007928
Stirrer shaft protection	4026446000950
Connection coupling VK 10 x 6	4026446007456
Connection coupling VK 10 x 8	4026446007423
Connection coupling VK 10 x 10	4026446007416
Connection coupling VK 12 x 10 (PLM)	4026446005252
Connection coupling VK 12 x 12 (PLM)	4026446005269
Connection coupling VK 12 x 14 (PLM)	4026446006471
Service unit WE-2018	4026446007515
Compressed air tubing ø 9 mm	4026446000622
Cylinder oil 500 ml	4026446000813
Food grade oil 500 ml	4026446005245

9.2 Stirring rotors

	Article no.
AR 1 Anchor ø 80 mm	4026446007935
AR 2 Anchor ø 100 mm	4026446007942
AR 3 Anchor ø 150 mm	4026446007959
BuddeMix 1 ø 60x10 mm	4026446007997
BuddeMix 2 ø 80x10 mm	4026446005351
BuddeMix 3 ø 120x10 mm	4026446005368
BuddeMix 4 ø 150x10 mm	4026446005375
BuddeMix 5 ø 150x12 mm	4026446005283
BuddeMix 6 ø 170x12 mm	4026446005290
BuddeMix 7 ø 210x14 mm	4026446005306
BuddeMix Mini 30 ø 35x8 mm	4026446008062
BuddeMix Mini 40 ø 46x8 mm	4026446008345
DR 1 Double blade ø 60 mm	4026446001278
DR 2 Double blade ø 80 mm	4026446001285
DS 1 Dissolver ø 30x8 mm	4026446001094
DS 2 Dissolver ø 40x10 mm	4026446008000
DS 3 Dissolver ø 50x10 mm	4026446006778
DS 4 Dissolver ø 60x10 mm	4026446008017
DS 5 Dissolver ø 70x10 mm	4026446008024
DS 6 Dissolver ø 80x10 mm	4026446007355
PR 1 Propeller ø 45x8 mm. 3-blade	4026446001230
PR 2 Propeller ø 55x8 mm. 3-blade	4026446001247
PR 3 Propeller ø 140 x 10 x 550 mm	4026446001254
PR 4 Propeller ø 140 x 10 x 850 mm	4026446001261
PR 5 Propeller ø 75x10 mm. 3-blade	4026446007669
PSR 1 Diagonal blade ø 50 mm	4026446001155
PSR 3 Diagonal blade ø 100 mm	4026446001179