



# OTTC Practical Diploma New German Pilot Program 2019

*1<sup>st</sup> educational year:*

Course	Content	Dates
MetB 1a	<ul style="list-style-type: none"> <li>• health and safety</li> <li>• practical tool skills</li> <li>• measuring</li> <li>• production processes: molding, forming, separating, adding</li> </ul>	
MetB 1b	<ul style="list-style-type: none"> <li>• foundations of mathematics</li> <li>• SI-Units</li> </ul>	
MetB 2	<ul style="list-style-type: none"> <li>• reading and drawing of technical drawings</li> </ul>	
MetB 3	<ul style="list-style-type: none"> <li>• practical production: cutting , filing, drilling, threading, rivet, etc.</li> </ul>	
MetB 4	<ul style="list-style-type: none"> <li>• welding, arc welding</li> <li>• manufacturing frames</li> <li>• channel-systems</li> </ul>	
RPI 1	<ul style="list-style-type: none"> <li>• copper pipe work: cutting, deburring, bending</li> <li>• pipe connection by flaring</li> </ul>	
RPI 2	<ul style="list-style-type: none"> <li>• pipe connection by using of fittings and swaging</li> <li>• brazing of copper pipes with soft solder, copper solder and silver solder</li> </ul>	
RPI 3	<ul style="list-style-type: none"> <li>• pipe installation</li> <li>• bracket building</li> <li>• insulating</li> </ul>	
Plant building 1	<ul style="list-style-type: none"> <li>• practical tests about MetB and RPI courses: building of a refrigeration plant incl. pressure test</li> </ul>	



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2<sup>nd</sup> educational year:

Course	Content	Dates
R1A	<ul style="list-style-type: none"> <li>foundations of thermodynamic and mechanic</li> <li>converting of formulas</li> </ul>	
R 1B	<ul style="list-style-type: none"> <li>physical basics of the refrigeration cycle</li> <li>foundations of of the log p, h diagram</li> <li>the single stage refrigeration cycle</li> <li>reading and connecting of service gauges</li> <li>practical measurements on refrigeration plants</li> </ul>	
ELC 1	<ul style="list-style-type: none"> <li>foundations of electrical</li> <li>direct current</li> <li>series and parallel connection</li> </ul>	
R 2A	<ul style="list-style-type: none"> <li>heat exchanger (evaporators and condensers): types, construction, function</li> <li>expansion devices: types, construction, function, interaction with the evaporator</li> </ul>	
R 2B	<ul style="list-style-type: none"> <li>compressors: types, construction, function, oil cycle, technical problems</li> </ul>	
ELC 2A	<ul style="list-style-type: none"> <li>single-phase alternating current</li> <li>basic electrical components (isolator switch, circuit breaker, contactor, relays, lights, switches, timer): types, construction, function</li> </ul>	
R 2C	<ul style="list-style-type: none"> <li>additional components: types, construction, function</li> <li>refrigerant, oil</li> <li>pressure test, evacuating</li> </ul>	
ELC 2B	<ul style="list-style-type: none"> <li>basics of electrical circuits (self holding circuit, interlocking circuit)</li> <li>basics of electrical circuits for refrigeration systems (load and control circuit, safety chain)</li> </ul>	
Mechanic	<ul style="list-style-type: none"> <li>Mechanical servicing of compressors, repair &amp; overhaul skills, fault identification. Belt drives, pulley alignment. Bearing service, Couplings, Key and Locking Devices</li> </ul>	
SH-R	<ul style="list-style-type: none"> <li>Authorized Practitioner training includes practical demonstration and hands on, using a reclaim unit and vacuum pump. All the Unit Standards to obtain the level 3 for Refrigeration SAQCC Gas. After successfully completion thereof they can apply for the SAQCC Gas Registration.</li> </ul>	
Technical drawing 1	<ul style="list-style-type: none"> <li>drawing flowcharts and electrical schematics of refrigeration systems</li> </ul>	
Plant building 2	<ul style="list-style-type: none"> <li>building and commissioning of a refrigeration plant with thermostatic control and defrost by coldroom air</li> <li>fault finding on refrigeration plants</li> </ul>	

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**Open Trade Training Centre**  
 Mrs. Isolde Döbelin, Director OTTC  
 1 Epidote Rd, Dersley, Springs, 1569  
 Tel. No.: 011-816-2580 Fax No.: 011-366-1219  
 mail to: [idobelin@icloud.com](mailto:idobelin@icloud.com) or [info@ottc.co.za](mailto:info@ottc.co.za)  
<http://www.ottc-training.center>  
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# OTTC Practical Diploma New German Pilot Program 2019

**3<sup>rd</sup> educational year:**

Course	Content	Dates
R 3	<ul style="list-style-type: none"> <li>• defrost methods</li> <li>• settings of the electronic controllers</li> <li>• evaluation of controller diagrams</li> </ul>	
ELC 3	<ul style="list-style-type: none"> <li>• circuits for refrigeration systems (defrost systems and electronic controllers)</li> <li>• construction and function of electronic controllers</li> </ul>	
R 4	<ul style="list-style-type: none"> <li>• methods of energy saving</li> <li>• secondary controls</li> <li>• heat recovery</li> <li>• skipping calculation of refrigeration systems</li> </ul>	
ELC 4	<ul style="list-style-type: none"> <li>• three-phase alternating current</li> <li>• single and three-phase motors</li> <li>• motor start-ups</li> <li>• other electrical components (coil, transformer, capacity): types, construction, function</li> <li>• electrical power station and electrical systems</li> </ul>	
Secondary cooling 1	<ul style="list-style-type: none"> <li>• hydraulic systems: types, construction, function, technical problems</li> <li>• hydraulic balance</li> </ul>	
Technical drawing 2	<ul style="list-style-type: none"> <li>• drawing flowcharts and electrical schematics of refrigeration systems</li> </ul>	
Plant building 3	<ul style="list-style-type: none"> <li>• building and commissioning of a refrigeration plant with electronic control, electrical and hotgas defrost</li> <li>• fault finding on refrigeration plants</li> </ul>	



## OTTC Practical Diploma New German Pilot Program 2019

4<sup>th</sup> educational year:

Course	Content	Dates
R 5	<ul style="list-style-type: none"> <li>• multiplex systems: types, construction, function, pipe installation</li> <li>• two stage cycles, cascade systems: types, construction, function</li> </ul>	
ELC 5	<ul style="list-style-type: none"> <li>• electronic motor management (soft starter, frequency converters): types, construction, function</li> <li>• faults in electrical systems</li> <li>• protection of electrical systems (earthing and earth leakages)</li> <li>• basic component and wiring sizing</li> </ul>	
CO <sub>2</sub> 1	<ul style="list-style-type: none"> <li>• subcritical and transcritical CO<sub>2</sub> plants: types, construction, function, pipe installation</li> </ul>	
Propane-/ CO <sub>2</sub> -SH	<ul style="list-style-type: none"> <li>• health and safety in dealing with propane and CO<sub>2</sub></li> <li>• charging and discharging of propane and CO<sub>2</sub></li> <li>• leak detecting systems</li> </ul>	
Technical drawing 3	<ul style="list-style-type: none"> <li>• drawing flowcharts and electrical schematics of refrigeration systems</li> </ul>	
Plant building 4	<ul style="list-style-type: none"> <li>• writing of logbooks</li> <li>• building and commissioning of a refrigeration plant to prepare the practical diploma</li> <li>• fault finding on refrigeration plants</li> </ul>	
Practical Diploma	<ul style="list-style-type: none"> <li>• building and commissioning of a refrigeration plant including of a theoretical and a practical test</li> </ul>	

**Duration of each course 1 week. Cost per week R 6,500.00 + 15 % VAT**

Quoted prices includes: training work-books, material, lunch, tea, coffee

Pass mark per course 60 %, pass mark for theoretical and practical Diploma test 75 %

Pre requisites: basic literacy and numeracy, courses are presented in English

All OTTC Courses are Unit Standard aligned

Assessments for NQF Learnership Qualifications and / or Trade Test testing can be arranged

Select your own course dates from OTTC programme. Preferred duration: spread over 3,5 years